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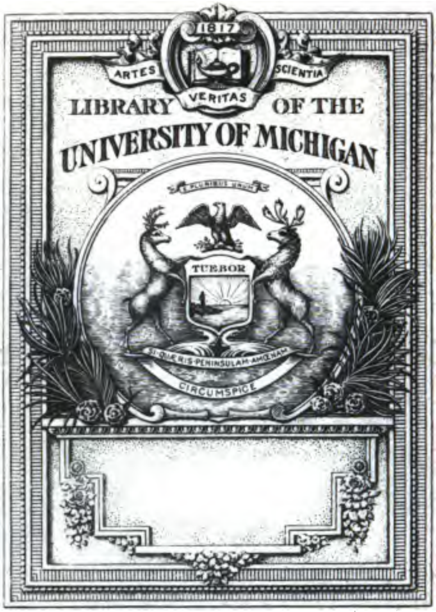

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PHOTOGRAPHIC

MOSAICS.

An Annual Record

OF

PHOTOGRAPHIC PROGRESS

EDITED BY

EDWARD L. WILSON,

Editor of Philadelphia Photographer.

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PUBLISHERS' NOTICE.

We desire that our patrons should pass judgment upon Photographic Mosaics for 1870 without comment from us.

Truly yours,

Benerman & Wilson.

Philadelphia, November, 1869.

67647

CONTENTS.

PAGE
*1869. By the Editor, 9
*On Backgrounds and Reflectors. By William Kurtz, 15
*Glass Cleaning. By W. J. Baker, 18
*Dark-Room Manipulation. By George H. Fennemore, 22
*On a Permanent Toning Bath. By H. T. Anthony, 26
*Landscape Photography. By John C. Browne, 27
*Suggestions on Posing. By J. H. Kent, 30
*On the Mounting of Prints and the Chemistry of Mountants. By V. G. Bloede, 33
*Practical Observations about Lenses and Cameras. By Prof. John Towler, M.D., 36
*Study of Art recommended to Photographers. By Wm. Notman, 44
*Additional Rays to Photographic Light. By David Duncan, 46
*Dry-Plate Work. By J. J. Bardwell, 48
The Golden Syrup Solution for Wet Plates. By H. P. Robinson, 51
On Intensity. *Canadian Journal of Photography*, 53
Position of the Studio. By Otto Buhler, 56
*Dirt. By the Editor, 58
Surface Stains and Marks on Negatives. By G. W. Simpson, M.A., 60
Carbolic Acid in the Printing Frame. By G. W. Simpson, M.A., 63
Silver Residues. *Canadian Journal of Photography*, 63
Poisoning by Cyanide and its Antidotes. By G. W. Simpson, M.A., 67
Observations on the Employment of Baths of Varnished Wood. By M. Clouzard, 69
Decolorizing the Printing Bath. By A. L. Henderson, 70
Modified Intensifying Process. By John Otto, 71
On the Bursting of Collodion Bottles. By R. W. Artlett, 72
Removal of Nitrate of Silver Stains from Cotton, Linen, etc. *Chemical News*, 74
On the Preservation of Negatives destined to be much Printed from. By M. Clement Sans, 75

---

* Written specially for Photographic Mosaics, 1870.

PAGE

*A Few Facts. By CHAS. WAGER HULL, ... 76

*To Work and Keep a Nitrate Bath Neutral. By WILLIAM BELL, 80

Marble Markings on the Negative. By L. G. KLEFFEL, . . . 82

Remarks upon Removing Varnish and Retouching Negatives. By F. STOBZE, ... 84

On the Recovery of Gold from the Toning Bath. By F. W. HART, 86

Indoor and Outdoor Hints. By NITRIC ACID, ... 87

The Developer. By E. DUNMORE, ... 88

On the Preservation of Negatives. By WILLIAM ENGLAND, . . 89

*Notes on Photographing Small Objects for the Stereoscope. By O. G. MASON, ... 91

Outdoor Work—Hints for Beginners. J. C. L, ... 95

On Exposure. By E. DUNMORE, ... 97

On Cleaning Glass Plates for Photographic Purposes. By L. G. KLEFFEL, ... 100

On Exposure. By O. R. GREEN, ... 102

New Method of Treating a Discolored Printing Bath. By W. ENGLAND, ... 103

*The Tea Dry Process. By H. J. NEWTON, ... 103

*The Whole Story. By the EDITOR, ... 105

How to Make a Background. By J. C. LEAKE, ... 106

Printing. By ALIQUIS, ... 108

The Pose. By H. P. ROBINSON, ... 110

Defects in the Negative—Causes and Remedies. By LAKE PRICE, 113

How to Sensitize Paper. By JABEZ HUGHES, ... 115

Defects in Paper Prints. By JABEZ HUGHES, ... 117

*The Magic Lantern in its Relations to Photography. By EDITOR, 118

Dark-Room Dodges. By J. C. L., ... 119

Developing and Toning Collodion Prints. By J. M. BURGESS, . 127

Fixing Negatives with Hyposulphite. By RUSSEL SEDGFIELD, . 128

On Retouching the Negative. By JOHANNES GRASSHOF, . . . 129

Artistic Effect in Photo. Prints. British Journal, ... 131

*On Pinholes. By B. W. KILBURN, ... 133

Bits of Information. Compiled, ... 133

*Many Mites from Many Minds. By the EDITOR, ... 142

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* Written specially for Photographic Mosaics, 1870.

PHOTOGRAPHIC MOSAICS.

1870.

1869.

BY EDWARD L. WILSON.

THE year 1869, or so much of it as has passed at this writing, has been full of interest and encouragement. Many useful ideas have been advanced, and much of real progress made since the year began.

One pleasing feature is the prevalent desire to improve. While there are many who are indifferent as to the results they produce, yet we know, from an extensive correspondence, that there are many more who have joined us in striving to elevate the art of photography and to improve their work. We know too that the average work of the country is better than it was a year ago. The cultivation of art principles, the striving after pictorial effect, the careful study of work by superior hands, have all had their effect in a most promising degree.

Another great lever has been set in motion quite perceptibly, and is doing a good work. We allude to the *National Photographic Association*, which has been formed and proven to be a success during this year. At its first Exhibition, held in Boston, in June, there was such a display of work as has never been seen in this country before. Many who visited there with preconceived notions and rusty ideas, returned to their homes determined to do better. They have turned out of the deep and worn ruts, in which they have been travelling for years, to a rougher road, perhaps, but to one which will lead them to greater fame and success.

Just as the paper and negative should be in close contact to secure the best results, so, many are finding out, should the members of our fraternity be in closer contact with each other to bring about the same ends, *i. e.*, perfect results. The interchange of thoughts, and ideas, and methods—the examination and discussion of each other's work, its faults and its excellencies, *will* have a great and good effect upon the future photography of this country, and we hope that the next Exhibition of the Association, to be held at Cleveland, in June, 1870, will be a large and splendid one, and that photographers from all quarters will congregate there to see it and each other. Those who are *earnest* cannot make a better outlay of time and money.

In photographic manipulations there have been several improvements made, which, though not great in their effects, are still very useful. The following pages will contain all of importance that has appeared in print, besides several articles written specially for them.

With a desire to secure absolute permanency, burnt-in enamels have had much attention. Messrs. Geymalt & Alker have issued a little pamphlet on the subject, without giving much information. Grüne still holds his process a secret, though he sells it, and, several in this country, prominent among whom are Mr. John A. Scholten, of St. Louis, and Mr. William Kurtz, of New York, have secured some very beautiful specimens in color. Still, the processes in use are very uncertain with inexperienced hands, and we want something simpler and easier.

Copying and enlarging by magnesium light, is becoming quite in vogue. Mr. J. Carbutt, of Chicago, has given a very useful paper on the subject, which make it both very easy and economical. As the magnesium light is one that can be called into play on rainy days, its use for copying and enlarging ought to become very popular.

The use of an India-rubber coating for preserving negatives has been deprecated by Dr. Vogel and others, and we can indorse the fact that it is dangerous and unreliable, causing white, opaque spots upon the film. India-rubber, as a mountant, is also of uncertain value. Some very beautiful prints we have from abroad, mounted with it, are curling away from the mounts, leaving an ugly substance behind.

The subject of intensification has had considerable attention.

Photographers are becoming aware that it is wrong to spoil a good negative by after-intensification to so great an extent that nothing but flat, black and white prints may be secured from their negatives. Instead of increasing the deposit, then, by the usual intensifiers, thus destroying much of the delicacy of the negative, a change of color has been found to give proper printing density by means of the use of uranium applied in solution to the negative. It has been said that this salt is sensitive to the light, and that, as negatives are used, they become objectionably intense. This we have not found to be the fact in our experience.

Permanganate of Potash is also used as an intensifier with great success and satisfaction.

The splitting of the negative film is an annoyance which all have had to share, and the causes thereof have been the source of much speculation. Imperfect washing, after fixing with hypo, dampness where the negatives are stored, and bad varnish, are the three great causes, and all easily avoided. Mr. Whiting, in the *News*, gives the following easy method of restoring negatives that are cracked, viz.: Pour a little warm alcohol over the film. It will soften the varnish; saturate the film; the ridges will go down, when a second varnishing will restore the negative to good condition.

The equalizing the exposure of the negative, a very desirable end, especially to the out-door worker, has been much more readily attained than heretofore, by the use of flare stops, and by shutters so arranged as to effect that end.

Dry processes continue to have their votaries, and much superior work has been obtained by them. The old tannin and coffee processes are, perhaps, still the best in good hands. Mr. M. Carey Lea has been very patient in his experiments with the collodio-bromide process, and claims it to be, as he now works it, quite as sensitive as the wet, requiring no longer exposure. The plates, he avers also, keep well. His results are very soft and beautiful, and have none of the harshness peculiar to dry work generally.

Ready-sensitized papers are now successfully made of excellent quality by Carrier and by Schaffer & Mohr, in Paris. The few experiments we have made with them, prove them to be very sensitive and of well-keeping qualities, prints four months old keeping without toning or fixing quite well without change of color.

Considerable discussion has ensued, as to which is most desirable—plain or albumen paper for printing. It is held, as of old, that prints on plain paper are the most permanent, but, the elegant results obtainable with albumen always win for it the victory and the first choice.

Carbon printing has not advanced much. Mr. J. R. Johnson has much simplified the process, and has joined hands with the Autotype Company, who continue to produce very beautiful results. A single transfer or *direct* carbon process is what we want. Mr. Blair has issued a little manual on the subject, full of ingenious suggestions, which will doubtless lead to the desired end.

Herr Albert, of Munich, has made great strides with his photolithographic process, giving us prints of all sizes, of beautiful quality and color, much resembling plain paper prints in softness and tone, yet hardly reaching them in detail. For certain subjects the process seems peculiarily adapted, such as bas-reliefs. It also answers well for portraiture, but for landscapes where there is foliage, the process falls short. His process is to coat a plate-glass with a solution of albumen, gelatine, and bichromate of potash, dry it, and expose the whole surface to the light to harden. It then receives another coating of gelatine and bichromate, and is exposed, when dry, under the negative. The insoluble parts are then washed away, and, when dry, from this plate the prints are made by the ordinary lithographic process. He uses a fatty ink; can print with a margin, but not over 125 to 150 prints per day from one *cliché*. That is slow work.

The printing process of the future, at least for large quantities, is Woodbury's photo-relief process. The immense strides that he has made during the year are perfectly wonderful. His prints upon glass and upon paper, are not to be distinguished from silver-albumen prints. The draperies are faultless, the high lights are like burnished ivory, and all the delicacies of the negative are admirably reproduced. We have seen 2000 prints of the same subject, as uniform as steel engravings—many more times so than silver prints can be. Prints can be made of any color, for it is merely in the mixing of the pigment, and the prints are easily made. One man can run six presses, and with them make 1200 to 1500 prints per day. The readers of the *Philadelphia Photographer* will soon be treated to a specimen print by this process, and also be able to have prints made from their own negatives, as we learn the process is soon to be worked in this country. For small quantities, of course, the treacherous silver process will always be useful, doubtless.

Mr. W. H. Davies has given a method of imparting to any kind of paper a printing surface, with a mixture of gelatine and gum lac in spirits, to which is added a few grains of a chloride. His process will be given in detail further on.

Papyroxyline, or paper gun-cotton, is becoming quite popular. Dr. Liesegang has generously made public his formulæ for its manufacture, and continues to prepare it himself for the trade.

Photography, as a cause of disease, should attract more attention than it does. Photographers should ventilate their apartments amply, avoid the use of dangerous chemicals, such as cyanide, and carefully use such as are necessary. Disease, then, will be no more likely to assail them than those pursuing other avocations.

An important place has been given to photography in the United States Patent Office, the drawings all being copied now by its means.

Retouching the negative is becoming quite general. Photographers no longer consider it a crime to resort to it if their work can be improved thereby. The use of the lead-pencil is the usual way of effecting it, and the best.

"Rembrandt effects" or shadow pictures are also quite the rage. An admirable example was published in the June *Philadelphia Photographer*. They are very pretty and effective.

Photographic coloring is also attracting much attention, the desires of the public seeming to run after better work, and colored. Many photographers are finding that they can utilize dull days by learning to color, which has been made very easy to understand by the issue of *How to Paint Photographs*, by George B. Ayres, Esq., artist, whose directions seem to be given right from the palette. The second edition of his book has just been issued.

Lea's Manual of Photography is another excellent book, issued by the publishers of *Mosaics*, and is the most complete manual that has ever been given to the world. The author devotes one part to instructions for the beginner; a second to the intricacies of the art and its improvements; many pages to "failures and their remedies," etc., etc., making a most complete, valuable, and useful handbook that should be in every studio.

Early in the year, a prominent photographer of this city sued a publisher of chromos for copying a copyrighted photograph, and lost the case on the ground that there was no law protecting photography by copyright. The National Photographic Association are to intercede with Congress for a law protecting the interests of the photographer in this matter.

The construction of the studio is a subject of lively interest to all who alter or build, and more care is devoted to it than heretofore. Many good models have been given in the *Philadelphia Photographer* during the year, and many new studios have been erected in this country during the year, giving evidence of prosperity. Good work can only be done in a good light.

The great Solar Eclipse, in August last, was photographed all along the line of totality, from Kentucky to Alaska, in some cases with admirable success. Much useful knowledge was obtained by means of the photographs taken, and valuable negatives made. It was an event which the interested and participators will not soon forget.

Photographers are beginning to learn that good apparatus is one great essential to the production of good results. The establishment of the American Optical Company has been an event in the history of the trade. It is producing the best of apparatus—such as give pleasure and profit to work with—in great quantities, and yet unable to supply the demand. This is also a good sign.

The erection of a number of new studios in first-class style, the improvement in the work, and the very general desire to do better, all combine to promise a bright future for American photography, and the day is not far distant when it will be respected and patronized to the satisfaction of all those whose productions deserve it.

The matter of lenses is one that continues to attract great attention among opticians, and they are striving hard to obtain *all* the good qualities desired by the artist. Dallmeyer continually wins fresh laurels. Voigtlander, too, stands among the highest, and has introduced several new lenses during the year. The New York Optical Works are striving to equal the best foreign lenses, and Steinheil's Aplanatic lenses are exciting a great deal of interest among the lovers of rotundity, and depth, and sharpness. Still we cry for the great combination that will do *everything*.

In order to encourage the production of good work, various prizes have been awarded by the publishers of the *Philadelphia Photographer* for good negatives and prints. We are sorry to say, that while there are many competitors, the average work is not good. Landscape work is particularly bad, and we hope to see great improvement in that branch during the coming year.

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(Written for Photographic Mosaics.)

ON BACKGROUNDS AND REFLECTORS.

BY W. KURTZ.

LONG before engaging in Photography myself, I inspected with great interest, the work of others in the art; and particularly with reference to artistic effect. My conclusion was, that if Photography could not be called a Fine Art, it sometimes came very near it—the one great drawback, however, was the universally monotonous appearance of the backgrounds. For instance: in a frame of ten pictures of different persons, each in costume differing from his neighbor, you would find the same light or dark background to one and all, thereby almost pointing out whence they originated, that is, from whose establishment they came. This was called good, even work; but I can only say that out of the ten backgrounds, but *one* had the proper weight of color, that is, one only produced the proper effect in relieving the face and figure by harmonious contrast. All this was years ago, at the time the good old 4 x 4 pictures were the rage. Great improvements have since been made. Fancy backgrounds have been introduced—but not to my fancy!—Panels, with *goblins*, paper-hangings, windows and doors, both real and painted, garden scenes, gates, trees, mountains, etc., etc., are all called into requisition and serve generally but to spoil many a good picture; however, I am told the public like it, and we can only wink at it.

Very fair results it is true, can be effected in this way, but to produce a picture wherein all shall be in good keeping, requires the utmost care and much time.

A full-length picture must be relieved by a broken background, and with painted clouds a fine effect can be obtained; with such a one, however, avoid leaning the figure on a desk, etc., and be careful to avoid a carpet for your foreground. Should the background be a painted landscape, do not have the sky of too dark a color, giving a cold and wintry effect, whereas, perhaps, the dress may be of thin material, with a straw hat, etc., etc.

Photographers must be aware that they are to produce effects by different means than those employed by artists. Therefore, it is better to do well what belongs legitimately to Photography, than by innovations, to aspire at something devoid of all artistic rule. If, however, you must transgress and introduce painted landscapes behind the figure, have as little of it as possible. With a broad background and plenty of room behind, you can foreshorten it and have it light or dark to suit your figure. The floor line will then run up on one side, and this has to be overcome by arranging the foreground in such a manner as to cover it.

The best Fancy Backgrounds I have ever seen, came from Paris. The figure relieved well against a broadly painted park scene, with a fine light effect on one side, and some excellently painted shrubbery (without much detail) connected well with the foreground, consisting of some real plants, rocks, etc. One picture, a full-length figure of a lady in black velvet dress, gave one the impression that the background was painted expressly for the figure, it was in such good keeping, and very *atmospheric;* but I am sorry to say, such was the case in this picture alone. In some of the others,—of which there were ten or twelve—the background was too heavy, in others too light, and in others again was out of keeping, the figure being altogether overpowered. But this is not of what you requested me to write. It is of the plain backgrounds for the legitimate heads and busts. That *all* persons should not be put against one and the same background, light or dark, is, I believe, understood. There are certain rules regulating this; but after all, it is much a matter of feeling.

For Heads and Busts, one middling gray background of woollen material is enough; out of this a very light or a very dark one can be made according to the angle in which you put it. Pictures,—that is, the likeness—are often condemned on account of the background alone; for instance: a blonde is placed in front of a light background, and to make matters worse, vignetted in the printing, for we all know that fair complexions, especially with light hair, take a little darker than they should, and if relieved on a lighter color, will by contrast look darker yet. Hence, the expressions: "Oh! it don't give any idea of her pretty shade of hair." "Oh! dear! she looks like a brunette"—etc., etc., and they are right. All persons of light complexions should be put against a darker background; if the picture is to be vignetted, darken your paper around the head a little, just enough to kill the glaring white of the paper; by this, the strength of the light on the head is kept, since everything else is darker, and the effect of a blonde is forced by proper contrast. This rule will work the other way as well. A dark sunburnt, or Cuban-complexioned gentleman, can be made to look very light by a pretty dark background, but the likeness will be better if relieved against a lighter one, since this gives the impression of a brunette at once; moreover, the background is to relieve a head all around and not on one side alone, as you frequently see done by photographers. Imagine one side of a lady's face well relieved from the background, it being the side on which the light strikes, whilst on the shadow side the background and face are of precisely the same color; of course the whole thing is ruined, whereas if the background had been pushed just six inches forward on the shadow side, that side would have been a shade lighter and the picture would have been all right. In nature the face is relieved well enough, because there is a contrast of color. Thus the portrait painter has an advantage over us poor fellows. We have a certain scale of tints, which lay between the highest light (the white of the paper) and the deepest shadow (nitrate of silver) to work with; the painter has all these and a great many more, since he relieves them in colors. This can best be proved by studying the figure on the ground glass of your camera, where it shows in good relief on account of color, but in the negative the relief is not so good, as the shadow of the face may come out of the same *tint* as the background.

This background should not be an even flat surface, but should graduate toward the light side of the figure, and lighter on the dark side. To accomplish this, photographers often paint a light spot on the dark ground to relieve the shadow, but this does not work well, since you have to raise or lower the background to get the light part where you wish it.

I have an idea with reference to a background which I am sure will work well. Instead of a graduated tint painted on the background, I propose to have the light itself throw a shadow over it, which will blend from dark to light much better than any artist with his brush can possibly do it. This the reader can illustrate for himself by means of a common saucer for a background and by placing in front of it a little doll's head. You will at once see what a great number of different effects you have at your command, by turning the saucer to the right or left, and by tipping it forwards and backwards; the blending is wonderfully soft, and you can have the shadow stop very suddenly also, without being harsh. If you put the doll under a top light, the top light will make a shadow on the background just where it should; and if you have your light on one side, the weight of the shadow on the saucer will also come where it should; and again, if you light up with both combined you will also find the little saucer do its duty nicely.

In conclusion, I wish some public-spirited fellow-photographer would go to work and build a light frame for suspending a gigantic saucer on a universal joint. The saucer should be about 5 or 6 feet in diameter, without any seams, and of a light material (*papier maché* or straw *maché*), which may be painted of a light gray.

I hope he will make his fortune by it, but he must not get out any *patents* for the same.

N. B.—Since writing the above, I have met at the Fair of the American Institute a gentleman who I think is just the person to make one of these "Saucers." I am now getting up the plans and drawings, and we will get at it in a short time; I shall then write you more fully on this subject.

……

(Written for Photographic Mosaics.)

GLASS CLEANING.

BY W. J. BAKER.

TO be relieved of any uncertainty attending the chemical or mechanical means we use in obtaining our impressions, is an essential step towards artistic photography. The anxiety with which the reactions are watched, when a plate or two has shown that they are not adequately presenting the light-effects, carefully adjusted on our subject, will effectually prevent the free exercise of judgment in handling. The sitter, to say nothing of the fatigue sure to be reflected in his or her face, is worried by half-a dozen or more sittings, when the first, or at most the second, ought to have been successful. You get into a flurry; your sitter notices it, and distrusts your knowledge of your business; you in turn suffer the mortification of seeing yourself regarded as an inefficient person, and of knowing that you cannot do your best.

Then the children: all the chagrin you might feel with an upgrown person, is augmented tenfold, if you find that you have one of the restless little ones all right and quiet, after long coaxing, but a streak, a spot, a little fog, too much intensity, or one or other of the thousand accidents a careless or ignorant operator is subject to, has blemished, maybe ruined, an otherwise beautiful negative. You prepare again, and go out to your coaxing and acrobatics, but the chances are, that the "young one" has by this time the invincible sulks or wonts.

Such accidents have no doubt led us all to study the avoidable causes of failure, and one of the first discoveries is, that absolutely clean glass is the *sine qua non* to success in all the after-operations.

There are a great many ways followed to attain this end. I should say, from observation, that some one or other of the polishing processes is the most usual.

With most glass and collodions these answer pretty well, but some plates will show rust or stains, and some films will slip or split in the drying, and at least, it is a slow and laborious method, not quite to be trusted.

It was proposed a few years ago to place between the glass and collodion a stratum of some substance which should adhere to the glass with more tenacity than the collodion could, and to which the collodion should adhere better than to the glass, and this stratum should, in addition to the above mechanical properties, be chemically negative both to the action of the light and developer.

Solutions of gum caoutchouc in hydrocarbon oils, of gelatine or albumen in water, have all been found to answer the above requirements, but difficulties in the preparation or application led to the abandonment of all but the latter, and this is so easy in its use, and certain, that it is a matter of surprise that it is not universally adopted. Nevertheless, the writer has suffered himself and knows of so many still enduring so much inconvenience from the enormous labor and unreliable results of hand-cleaned glass, that it seems to him of enough importance to warrant the preparation of this paper on a subject that many will no doubt regard as trite. Those, then, who already "know it all," and habitually travel on the highest stilts, may spare themselves the trouble of reading further, as the remainder of this little chapter will be devoted to pointing out a method of albumenizing, which has claims only on the attention of those who are in want, and feel the need of some plan of cleaning their glass, which will save labor, and give surfaces perfectly clean, without a chance of a failure, if those who try it will do just as instructed, nothing more or less.

Make a mixture of	Nitric Acid,	1 part.
	Muriatic Acid,	1 "
	Water,	2 "

A large earthen jar, of glazed stone-ware, is good to hold this, and the cover will prevent any perceptible fumes from escaping. This mixture is not strong enough to affect the hands, which may be plunged in it with impunity, though it may be rather stinging to sores.

The glass may be laid in it over night, and can remain there any length of time without injury. Its strength can be maintained by adding, from time to time, a little of the two acids.

To prepare the albumen, take the whites of half a dozen fresh eggs, be sure that none of the yolk gets in, whip to a stiff froth, and let it stand all night; then pour the clear settlings into a bottle, add an equal bulk of water, and enough liquor ammonia to give it a perceptible odor. This is stock albumen, and will remain fresh, just as long as you can perceive the smell of the Ammonia. Keep it well corked, and when the odor of the Ammonia grows faint, add a few drops more. The albumenizing solution is:

Stock Albumen,	1 oz.
Water,	12 "

Filter this through cotton, in a funnel, with a stem long enough to almost touch the bottom of the vessel you filter into. This will avoid the formation of air-bubbles; or you can filter into a toy teapot, then as the spout draws off from the bottom, it will not trouble you by pouring out the air-bubbles, which you must not let come on the glass plate.

Now all is ready. Take the glasses out of the acid, letting them drain, set them in a wooden pail, take the pail where you can command running water, pick out a glass, hold it under the water, running in a small stream, rub the plate with a scrubbing brush brush broom, or your hands, turn the plate over, wash and rub the other side, turn it back, rinse the first side a moment, hold the plate up, and let the water run off, but not so long as to show any dry spots, level the plate and flow it with the filtered dilute albumen, just as you would with collodion, only let the excess of the albumen go down the sink instead of saving it. Stand the glass in a portable rack to dry. Treat each plate in this manner, keeping the albumenized sides all the same way in the rack. They are ready for use as soon as dry, and may be placed on one end, on your dark-room shelf, or if not intended for immediate use, they are better stored in grooved boxes covered. A piece of paper over those on the shelf will protect them from dust. If you are by accident in doubt as to which side was albumenized, the fact that the breath will not show on that side will point it out. It is better to blow dust off than to use a brush.

In applying the albumen it would not be well to commence by raising a dust in the room, though at the same time it is not necessary to take very great precautions against particles floating in the atmosphere, it is enough if the room has not been disturbed for a few hours previous.

An error beginners are very likely to fall into, is that of using too much albumen in the solution. Reasoning analogically, if a thin stratum will protect the film from dirt or rust on the plate, a thick one would do yet better; but the fact is just the other way. Use as little albumen as you can. The proportions given are one ounce to twenty-four, and if it is made thicker, the plates will show comets and mottling in outrageous confusion. The thin albumen can be kept, by the addition of ammonia, just as well as the stock albumen. There is no fear of ammonia getting into the bath, it is so volatile, that it is gone long before the plate is dry. Neither will the albumen injure the bath; indeed, where the plates are prepared this way, the bath seems to keep in condition an unusually long time.

The acid solution is not recommended for removing films from glass. I never allow it to get dirty with such stuff. Any failure is at once scraped from the plate with a flat stick, the plate well washed, and placed in the acid when convenient. In this way the silver in the spoiled plate goes into the developing tank and is saved, and the acid has only the bare glass surface to act on.

Varnished negatives are best cleaned by a solution of the "concentrated lye," sold in tin cans. Do not leave the glass in this too long, or it may rust. As soon as the varnish is soft enough, scrape it off, let it accumulate in the lye. The silver on any quantity of negatives is worth saving. The glass as soon as scraped should be washed, and is then ready for the acid.

In following the above instructions, a possible cause of failure might be unwittingly run into, although I have never known it to happen. All water may not be fit to use for the final washing previously to applying the dilute albumen, or for mixing with the albumen. If this is suspected, the albumen might be prepared with clean ice-water, and the plate rinsed with the same, or clear rain-water, just before the albumen is poured on ; this will remove the impure washing water effectually, and add but little to the trouble.

None who have used plates cleaned in this way, ever willingly go back to polishing; and having done what I can to recommend and describe the process, I lay it before you, hoping that if tedious, I have been sufficiently minute, so that none, however inexperienced, can fail, even in the first attempt.

(Written for Photographic Mosaics.)

DARK-ROOM MANIPULATION.

BY GEORGE H. FENNEMORE.

HOW many photographers there are who really try hard to make clean and fine negatives, and yet how few succeed. But it is not generally the fault of the formulæ they use, so much as it is the want of care necessary to produce the best results that any formulæ will give. The best photographers I know, use the simplest and least complicated formulæ. I propose, then, in these few lines to state how any ordinarily good formulæ can be worked successfully. To do this, four things are necessary. First, a good dark-room ; second, good chemicals ; third, good apparatus ; and last, a person with a fair share of brains to know how to use them. First, then, the dark-room claims our attention. This, if possible, should be well lighted with an orange-colored light ; if that is not possible, procure a ground glass globe from any gasfitter to suit your lamp or gasburner. This can be made perfectly nonactinic in the following simple manner : Dissolve a few grains of aniline Bismarck brown in a couple of ounces of negative varnish ; warm the globe slightly, pour the solution in it, and run it around till it is coated evenly all over, and dry. If the color is not deep enough, give it a second coat. If you cannot procure the aniline color in the country, your stockdealer can procure it for you at any time. This will light your room without injuring your plates. The next thing is, to see that the developing and fixing tanks are contiguous to the washing tank, so that the plates can be transferred from one to the other without the solution being dropped upon the floor. This is important, for the reason, that iron and hypo when dropped upon the floor crystallize when dry, and being trodden into an impalpable powder soon fill the air, and of course settle more or less upon your sensitive plates; such particles being dissolved by the silver solution and developer, form pinholes and other stains and markings. This has been a serious annoyance to many of the less experienced in the art, without their ever knowing the cause. Next, your silver bath should be placed at such a distance from the developing and fixing tanks, that by no possibility, can any iron or hypo get splashed into it. Clear out everything that does not belong in the dark-room, particularly dirt. Scrub your floor, using plenty of water; and after that just wipe it up every morning with a damp cloth or sponge and never sweep it. In this way you can keep your dark-room perfectly clean, and will be but little troubled with dust of any kind.

Having your room in order, the next thing to secure a clean negative, is to have clean glass. This should be done thoroughly by any of the known methods, or what I consider better, and the plan I adopt myself, is to albumenize my plates. To do so, I proceed as follows: The whites of eight fresh eggs are beaten to a stiff froth and left for several hours to subside; the albumen is then poured into a clean white half-gallon bottle and water added sufficient to make sixty-four ounces in all. It assumes a slightly milky appearance. Then add strong ammonia, drop by drop, shaking well until all milkiness disappears, and it is as clear as water. This is the stock solution, and will keep any length of time, but you must keep it corked to prevent the evaporation of the ammonia. When wanted for use filter five or six ounces through a clean piece of sponge pressed tightly in the neck of a glass funnel into a lipped bottle suitable for pouring from, and as you wash your glass, drain awhile, pour a little of the albumen solution on the upper corner of the glass, make it run all over the plate to the lower corner, carrying the excess of water with it, and rear it on your pegs to dry. Glass prepared in this way needs no further cleaning, and the most rotten collodion will never leave the glass.

Having a supply of clean glass, the next thing to give attention is the collodion. This should be of good quality and well ripe, but not old and insensitive. When the latter is the case, it is red, and works very slowly. Such collodion may be restored easily by making an equal bulk of new collodion iodized with iodide and bromide of cadmium only. Mix the two, and set aside for a few days. Such treatment will effectually restore it.

The nitrate bath is the next to claim our attention, and this is by far the most troublesome agent the inexperienced photographer has to deal with. To a first-class photographer, it seems almost superfluous to write anything about keeping the negative bath in order. And so it is for them. But, if they could only see the quantity of letters that daily visit, from month to month, the table of any editor of a Photographic Journal, they would be somewhat astonished, some asking the remedy for pinholes, others for fogging, others again for streaks and stains of every description, etc. And this, in the face of all that has been written upon the subject. In one of the late numbers of the *Philadelphia Photographer*, I described an excellent plan, and the one that I always adopt to keep my negative bath in order. I can not do better than to reproduce it here for the benefit of the readers of *Mosaics*.

"The treatment of the bath for pinholes, is to dilute the solution with an equal bulk of water. But, in my experience, I have found that this is not always a remedy for any length of time. For a comparatively new bath, that amount or even *less* of water, will answer the purpose. But when a bath becomes old and overworked, it appears to acquire the power of accumulating a large amount of iodo-nitrate of silver, which requires much water to bring it to subjection. I have seen solutions that gave plates full of pinholes, and, when held down, the surface looked like a piece of sand-paper. Such a solution, diluted with one-half its bulk of water, would scarcely show turbidity, and would not benefit the bath for more than a day or so. Again, old silver solutions, unlike other solutions, deposit more of these crystals when at a high temperature than at a low one. In winter, therefore, when the water is cold, its effect is lessened by its lowering the temperature of the solution. The plan, therefore, that I have found most serviceable, is to dilute the bath with four or five times its volume of water, the temperature of which has been raised to about 90° to 100° Fahrenheit. This throws down a dense, whitish-yellow precipitate, which is easily filtered out. When filtered clear, it is evaporated to fusion, re-dissolved in distilled water, and filtered. It has now an alkaline reaction on red litmus paper. Chemically pure nitric acid must be added until blue litmus paper turns slowly red. If it is the proper strength, it is then ready for use, and is as good as any new bath. This treatment purifies it from all organic matter. Some photographers use acetic acid in the bath, but this must by no means be used to make a bath acid after fusion, or you will have solarized lights without detail in the shadows. Should the bath be in good working order, with the exception of pinholes, the fusion may be omitted, but the dilution must be with distilled water, and then evaporated to its original volume of solution, filtered, and fresh crystals of silver added to make it 40 grains strong. A photographer who values his reputation for good work, will always have *two* negative solutions, and as soon as one shows signs of exhaustion, it should be relieved and replenished, put in the light until the next one shows signs of exhaustion, and so on until pinholes again appear, when it can be again diluted and treated as above recommended."

The above in my hands has always proved effectual.

In developing, see that the developer is filtered clear, and flow it over the plate in one even wave. Do not have it too strong, or semicircular lines radiating from the corner will be the result; neither must you have it too weak, or hardness and want of half tone will be the result. From twenty to thirty grains to the ounce will be about right. Have all your developing clean, and wash both your negative and your hands well after each operation. Finally, fix your negative, wash it well, and dry it. If any one will follow the above directions carefully they need not be troubled in producing good negatives. Lastly, a few words on the apparatus. If it is not in good condition, all the trouble spent on chemicals are useless. See, then, that the camera is in the best condition to ass[illegible] the chemicals to produce the best results, *i. e.*, see that there are no chinks or cracks in the woodwork, or holes in the corners of the bellows, by which white light is admitted; see that the lenses are clean and covered with a hood to keep out reflected light. Keep it in the dark as much as possible when ope-

rating. Having accomplished the above necessary conditions, go to work, pose and light your sitter artistically, and I think you will soon go home at night with a lighter heart and heavier pocket.

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(Written for Photographic Mosaics.)

ON A PERMANENT TONING BATH.

BY H. T. ANTHONY.

HAVING used the same solutions for toning for four or five years past, and finding the bath always reliable and uniform in acting, I think it desirable to be known by photographers generally.

The first thing to be done in preparing this toning bath, is to provide a neutral solution of chloride of gold. This I do by adding excess of carbonate of baryta to a strong solution of chloride of gold. At ordinary temperatures and with occasional shaking, the solution will be ready for use in three days. The strength of solution of gold is one bottle or fifteen grains of Anthony's chloride of gold to an ounce of water. This solution being ready the bath is prepared as follows:

In one gallon of water diffuse ten grains of fresh dry chloride of lime, thirty grains of air-slaked lime, one drachm of salt, and one ounce of the above neutral gold solution, shake them thoroughly together and allow to stand for a week, the bath can then be used. Pour off the clear portion free from the sediment and add one-quarter ounce of the neutral gold solution, stir intimately and allow to stand a short time. Try a single print. If the bath tones gray and flat, the prints not acquiring the deep color necessary in the shadows, add to the bath from five to ten grains of crystalline acetate of soda; this will correct the tendency to flatness. If now the prints tone too slowly, add from five to ten grains of bicarbonate of soda. By the judicious use of the alkaline materials generally used in toning and the chloride of lime, this bath can be used, as our experience shows, for years, making a great economy in the expense of gold. The probable reason why this bath continues to act is that the gold being already neutralized when added to the bath, needs no excess of alkali to produce that effect. The amount added in the presence of the free chlorine is not sufficient to reduce the gold to the metallic state, and the reduction is determined by the presence of the silver of the print. The moment the print is removed the reducing action is arrested and the bath remains without change.

It remains but to observe that no gold should be added to the bath but the neutralized gold described. The addition of the materials from time to time should be small in quantity. The chloride of lime, when needed, should never be added in quantity larger than ordinary pigeon-shot. In adding this it should be moistened in the palm of the hand with a little of the toning bath, rubbed into a pasty consistence, and then washed off into the bath and thoroughly mixed with it. The bath should always smell perceptibly of free chlorine.

After using, it should be poured into the bottle in which it was mixed and tightly corked.

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(Written for Photographic Mosaics.)

LANDSCAPE PHOTOGRAPHY.

BY JOHN C. BROWNE.

THIS subject has been written upon so often that new material of interest is somewhat difficult to obtain, but as every photographer has some peculiarity in ideas and manipulation different from his neighbor, it sometimes is interesting to know what those peculiarities may be. I will, therefore, try to give a few practical suggestions on the subject of Landscape Photography.

In arranging the many articles necessary for a photographic trip, it is desirable to have some system of packing. I have, for example, a card placed in some conspicuous position in my laboratory with the names of all the chemicals and apparatus that are to be included in the expedition distinctly written upon it.

When packing I read over the list and place each article as mentioned on a table kept clear of other things. By this simple plan I have seldom found it necessary to lament the loss of anything of importance. When miles away from my laboratory, for convenience in travelling, I have used for many years a basket in preference to boxes for carrying my traps. It is much lighter and is not subjected to such hard usage when travelling by rail. A tin can can be readily made to fit into it, so that bottles of chemicals may be in separate compartments and less liable to breakage.

Do not let the sole object of the journey be to make as many negatives as is possible in a given time. Pictures that are made in great haste usually show faults in arrangement that might have been avoided by a careful study of the different localities before attempting to expose a plate.

Try as much as possible to arrange the camera so that the lens shall not face the sun. When it cannot be avoided, hold the dark slide or any dark object (a hat for example), in such a position that the direct rays of the sun will not strike the lens.

The experience that I have had in the use of sky-shades (Mr. Sutton's form of diaphragm) has been very satisfactory, and I would urgently advocate its general use in out-door work.

Advantage should be taken of the early morning and afternoon light in preference to midday during the summer months. Better pictures can generally be made before 11 A.M and after 3 P.M., as the sun is not so directly overhead and allows the introduction of the pleasing as well as artistic effect of long shadows in the landscape.

For out-door photography it is of the first importance to have the outfit made as light and portable as possible. Make it a study before starting upon a trip to reduce everything to the smallest weight and space. The lightest and easiest tent to carry, put up in working order, and repack, that I have ever used, is a spring-jointed tripod with a cone-shaped covering of dark material.

Use a covered bath somewhat larger than the plate used, which will allow more space to move the plate when coating.

After the collodionized plate has been a sufficient time in the silver bath, drain and rest its edge upon a piece of soft tissue-paper. Wipe the back with a damp sponge. By so doing, the plate-holder will be kept in a more cleanly condition, the slide not liable to stick, and the plate will not have the tendency to stain from excess of silver solution. Be particularly careful not to reverse the drainage after the plate has rested upon the tissue-paper.

One of the most frequent causes of failure in photographic views is, that the exposure has been too little. This is especially the case when lenses are used requiring very small stops. *To give plenty of time*, is in my judgment one of the first steps towards success. Dry the negative perfectly before placing in the plate-box. One box will then be found sufficient, except when far away from an abundant supply of water. Under such circumstances, wash the plate with as little water as possible after development, and flow over it a dilute solution of glycerine in water. Place the plate while wet in a box made of tin, similar in construction to an ordinary plate-box.

Negatives packed in this manner will remain wet for days, and can be redeveloped or fixed when convenient.

To save space, allow the grooves in the box to be wide enough for two, back to back.

After each day's work make it a rule always to filter the nitrate solution, and if necessary, wash out the bath, using a stick with a piece of sponge fastened to the end, to clean it thoroughly. If many plates have been dipped add nitrate of silver to bring up the strength to 45 grs. It is not advisable to have a bath containing over that amount in silver.

Whatever may be the opinion in regard to the advisability of excessive sharpness in portrait photographs, I have never heard the statement doubted that the first point of importance in a landscape photograph should be the greatest amount of sharpness obtainable over the whole plate.

Yet how many pictures are constantly to be met with lacking that very desirable requisite? Various excuses are given for such defects, such as, "camera out of order," "bad lens," &c. But I am inclined to think that most of the fault is traceable to want of care in focussing the picture. Mr. Zentmayer's admirable lens offers an easy stepping-stone over the difficulty, as no focussing is necessary in the field. The proper focus is carefully ascertained before leaving home, and a mark made upon the camera-box which will in all cases be found correct. But lenses of different construction require great care to obtain the exact focus. It is unfortunate that rack-work is not attached to all lenses requiring a change of focus, as correct focussing is much more certain by turning the lens adjustment than by the camera rack-work.

A good plan in out-door photography is to focus upon the bark of a tree if possible, turning the focus of the lens upon the foreground rather than the extreme distance of the view.

One other fault is frequently observable. Want of care in levelling the camera. In representations of buildings it is most likely to occur, giving the effect of the entire structure tumbling over with a crash. But landscape views are by no means free from its demoralizing tendencies, for mountains and trees are frequently represented in the same tottering condition. To avoid such unpleasant effects, do not trust to having a straight eye, but have a spirit-level attached to the camera, and consult it before exposing the picture. Much time can be saved in adjusting by the use of a tripod having a ball-and-socket joint.

As a rule it is best not to intensify landscape negatives, as much of the softness or half tones of the picture are sacrificed, even under the most favorable circumstances.

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(Written for Photographic Mosaics.)

SUGGESTIONS ON POSING.

BY J. H. KENT.

THE extra difficulties of most photographers are the nerves and ignorance, and fidgets and waywardness of their sitters. Persons usually come to a photograph gallery with a set purpose to be buckram, and a certain foreknowledge of getting swindled, or else with so little purpose that they are too passive to manipulate into anything more expressive than putty. The majority come with a cherished dread, "had as soon encounter the dentist or the hangman," a state of mind conducive of anything but a happy expression. Some come with the crudest notions of what they want or how it is done, ask to have a "likeness struck off," and follow their noses and finger-boards to the letter. Posts and blocks and imbeciles come of these, unless great care is taken. If told to look at a point, they do look to that degree you repent of the injunction; or if asked to sit motionless, they emphasize the act till there is a twofold impression of themselves at either extremity.

There is but little choice in the genus sitters, all of whom, to say the least, afford opportunity for patience, latitude for serenity, and scope for talent. The only remedy remaining is how best to meet the emergency.

In the first place, every photographer should be master of the situation; and not only that, but also master of his own nerves and temper and those of his sitter. By your own firmness and equableness, magnetize and tone into tranquillity the highstrung, and when the posts and blocks get around, by your ease and suavity unbend them and get them at their best.

All photographers have noticed that most persons when they come for pictures, and especially ladies, will declare "they never had a good likeness," that they "look horridly," and "their friends never recognize them," and "they have come for a last effort," etc. They will ask how they shall sit, where they shall put their hands to get them out of sight, what they shall look at, and nearly always insist that the light is too strong for their weak eyes. Certainly no good picture can be made of a person in this nervous anxious frame of mind. So in your instructions and conversation get their thoughts as much as possible off themselves, and assure them that the only requisite to success is a perfect indifference on their part, and passive submission to being posed and keeping so until the plate is exposed.

If, on the other hand, the sitter is inclined not to talk, and sits with a dogged determination to be photographed a martyr, talk *to* him, and by some stroke of policy get him to open his mouth, and relax his muscles, keeping him the while in the position that presents the best face to the camera.

In regard to eyes. It is not the strong light usually, but the idea that it is something terrible and will nearly blind them. This can generally be remedied by a little skill and tact. Place several small and interesting objects at quite a distance from the sitter and request him to look at, and study *all of them*. Finally, as you expose the plate call his attention to one in particular. In this way the eye will never become watery and tired, *before*, if it does *during* the sitting.

Generally allow no long pauses in conversation, giving no time for the feet and hands to become conscious.

At the same time *work*, and work to a purpose. Let every motion count, but never hurry. Do dexterously, but not obviously the posing. See with rapid glances your rocks ahead; that a big nose will not beautify a profile, that blue eyes must not be turned toward the light. That long necks and long faces must have the benefit of an inclined brow. That really weak eyes must be turned downward to some definite object. That high chignons, big collars, and blue bows disfigure, and should be banished. See all these things to obviate, but not to embellish your conversation. Get your sitter's thoughts away from his own peculiar blemishes, which would only be aggravated by any effort on his part at concealment. That art lies wholly with yourself, and the greater your skill, the more certain your success.

For despatch and convenience, 'tis best to have accessories arranged and waiting. In rustics, have the scenery adjusted, the rocks, stumps, stones, foliage, and backgrounds all effectively made up, with suitable openings in which to place your subject. By thus doing, there intervene no long moments of waiting. No losing heart and expression on the one side, nor a hurried, jumbled-up mess on the other. Also have at hand, books, fans, flowers, ornaments, *yellow*-tinted letters filled with suggestions with which ladies can beguile themselves and their hands. Have canes, hats, pencils, pens, and more books, to ease off the angularity of masculines. Provide jumping-jacks, barking dogs, tin-whistles, jews-harps, and a small organ, to bamboozle the babies. Besides, be able *yourself* to turn into an acrobat, gymnast, or long-tailed monkey, on the shortest notice.

To astonish one of these small fry into a moment's quiet, at whatever cost to your dignity, manhood, grace, or suspenders, will elicit, if not the maternal admiration, her broadest grin, who half believes you are rehearsing for *her* benefit some former accomplishment acquired when you were connected with the circus.

Drapery, as we all know, has important considerations; a quick, intuitive perception of its effects should imbue every photographist. It is better to lose occasionally an opportunity of improving one's exchequer by sending a customer away for more harmonizing attire, than sacrifice both picture and reputation. Simply getting a likeness is the lowest idea in photography. The likeness must be had, but with it, all the added advantages of position, presentation, light, and mood.

The camera undirected can produce no better than a Japanese jack-knife. There must be brain and art behind it. Untiring assiduity must be given to these matters, and effects be a perpetual study.

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(Written for Photographic Mosaics.)

ON THE MOUNTING OF PRINTS, AND THE CHEMISTRY OF MOUNTANTS.

BY V. G. BLOEDE, CHEMIST.

THOUGH every nook and corner of photography, and subjects in the slightest degree connected with the same, have been explored and overhauled, until there seems not to be a single branch of the same which has not been written upon by a score of authors; yet comparatively very little attention has been paid to the investigation of the nature and properties of adhesive substances used in mounting prints, in order to determine which of them, or which combination of them, is best adapted for this purpose. The great importance of the subject both in regard to the finish and permanency of the print, is, I think, generally admitted; a thorough and scientific though concise treatment of the subject will therefore doubtless be generally received with interest, and read with some little profit by the practical photographer.

There is scarcely an adhesive substance known to commerce, which has not been tried and more or less generally adopted by the profession. Yet after due trial, the preference has been invariably given to starch paste, and for reasons which can be explained on scientific grounds.

There is not another substance which, taking cost and chemical pros and cons into consideration, can at all compare with simple starch paste as a mountant. In the first place, let us consider what properties a good mountant should possess: It should be cheap, white or at least not highly colored, not liable to spontaneous change or fermentation when upon the mounted and finished print, not readily soluble or readily affected by moist air, must be easy of preparation, not easily absorbed into the tissue of the card or paper, not liable to chip or peel off by age, nor in any manner to undergo a spontaneous change or chemical decomposition which would destroy or affect the beauty of the print. Taking all these points into consideration, we see at a glance that the selection of starch paste as a mountant was a most judicious and excellent one. The chief objection to gum arabic, dextrine, the so-called flourine, and other like gums, is their liability to undergo spontaneous change by acetous fermentation, untechnically termed "souring." This change is produced in them by their containing variable quantities of the substance known as grape sugar, which especially in dextrine is rapidly changed into acetic acid, which if it does not destroy the print, has at least the property of dissolving the albumen, thus giving rise to a dull print without brilliancy, a trouble which many photographers have experienced without being able to explain. Though it is true starch also "sours" *in solution, yet it never undergoes this change or alters in composition when once upon the dried and finished print.* Then it never soaks into the texture of the paper as gums do, but forming a sort of sizing upon its surface, adds greatly to the gloss and beauty of the finished print.

Glue is next best to starch, but there are objections to its use, which have successfully excluded it from competition. The objections are, however, entirely mechanical, and chemically considered it is fully equal to starch. Having, we think, explained satisfactorily the universal preference for starch, and shown that on chemical grounds alone, it is fully sustained, we will proceed to give some formulas for the preparation of several mountants of superior excellence.

SIMPLE STARCH PASTE.

Corn, wheat, potato, or rye starch, may be used for this purpose. The common laundry starch (in this country consisting of corn starch) is perfectly good and reliable. To prepare it pour cold water upon a few ounces of the starch and rub it into an even paste; add this paste under constant stirring to briskly boiling water, until an even and homogeneous paste of sufficient thickness has been formed. Then remove the pot from the fire and strain its contents through a piece of Canton flannel, having its woolly side turned inwards. This paste can be preserved without change for a considerable time in the manner to be hereafter described.

COMPOUND STARCH PASTE.

Take a handful of white glue, and allow it to become perfectly soft by soaking in cold water. Then prepare a somewhat thin starch paste, and while it is boiling briskly add the glue in the proportion of 2 to 3 ounces to every pint of paste. When the whole of the glue has been dissolved, strain the paste in the manner directed above. This paste becomes jelly-like when cold, and can best be used warm. For this purpose place the vessel containing it in a pot full of boiling water.

GUM TRAGACANTH PASTE.

One of the very best materials for mounting prints, and one that has received the least attention, is gum tragacanth. It can be made into a paste of any required consistency with *cold water*, thus overcoming the chief objection to starch paste—the trouble of preparation. In appearance and properties it greatly resembles starch, and the only objection to its use is its cost. As, however, one pound of gum will make several quarts of paste, the cost is not so very great.

The mode of preparing the paste is very simple. Place a quarter of a pound of the gum in any convenient vessel, and pour a quart of lukewarm water upon it. Allow this to remain until the gum has been perfectly softened and dissolved. Strain through fine cloth, having previously diluted it to proper consistency.

GELATINE PASTE.

Add to the foregoing paste two ounces of glue or gelatine to each pint of paste, and let it dissolve thoroughly, then strain.

GUM ARABIC AND STARCH PASTE.

The adhesive properties of starch paste may be greatly heightened by using the following formula: Add four ounces of gum arabic to a quart of water, and let it dissolve perfectly. Bring the thin mucilage thus obtained to a brisk boiling, and add sufficient starch to make a paste of the required consistency.

Finally, as to the best and most efficient methods of preserving starch paste, or other mountants, during the hot season, when they are so liable to change. Any strong essential oil has preservative power, so has creasote and carbolic acid, the latter to an extraordinary extent. The strong smell of creasote, however, makes it entirely unfit for use. If an essential oil is used, it not only preserves the paste for a considerable time, but also imparts a pleasant smell to the print. Alcohol, too, has some preservative power, and has been frequently suggested for this purpose, but is not very efficient. The following solutions are excellent :

Alcohol,	4 ounces.
Oil of cloves,	½ ounce.

Alcohol,	4 ounces.
Oil of bitter almonds,	½ ounce.
Oil of cloves,	½ "

Alcohol,	4 ounces.
Oil of sassafras,	2 "

Alcohol,	4 ounces.
Oil of wintergreen,	2 "

Add one ounce of either of these solutions to every half gallon or gallon of the paste, and it will keep three times as long as without this addition.

(Written for Photographic Mosaics.)

PRACTICAL OBSERVATIONS ABOUT LENSES AND CAMERAS.

BY JOHN TOWLER, M.D.

THERE are several points about a camera and a lens which it is necessary for the photographer to know. In the first place, from his own impulse, he will naturally desire to know whether they are good or bad, perfect or imperfect. Now to decide upon the point, he must first know what constitutes a perfect camera, and what a perfect lens; and secondly, what the general imperfections are to which either is subject.

To be brief, a perfect camera is one in which the sliding part is perfectly parallel with the front, and slides through its whole range in perfect parallelism with the front, which must be at right angles with the base. These are very essential points.

Secondly, the camera must be perfectly impervious to light, that is, no light must enter through pinholes, screwholes, corners of the bellows, or the slit of the side of the plate-holder.

Thirdly, the surface of the ground glass and the surface of the sensitized plate must, through the whole range of the bellows-slide, be parallel with the front and at the same exact distance from the posterior surface of the lens.

Fourthly, the camera must be rigid in every position, easily clamped and unclamped in focussing, and capable of being focussed both by a quick and a slow motion, independent of the rack-and-pinion movement of the lens.

Finally, the swing-back, which possesses both a vertical and a lateral movement, and a sliding front, both vertically and laterally, add to the complete perfection of a camera.

A lens, to be perfect, must be free from both spherical and chromatic aberration; it must be capable of producing a sharp picture with the full opening; it must do the work quickly; it must possess great depth of focus. None of these essential points can exist if the glasses of which the lens is constructed are not homogeneous in their kind, if the curves are not accurately made in accordance with the proper mathematical deductions, if the grinding, polishing, and centring are not complete and accurate; and if the components have been displaced or not originally properly mounted as regards distance apart, parallelism, and verticality to the brass tube. It is evident from the foregoing, that we have four things to examine, namely, the plate-holder, the ground glass, the camera proper, and the lens. We will begin with the plate-holder.

EXAMINATION OF THE PLATE-HOLDER AND SHIELDS.

In the first place draw out the slide and then examine the slit, in order to see if any light can get through it, owing to any inequality in the closing of the spring. This latter is apt to get rusty sometimes, or otherwise get clogged in its movement, so as not to close immediately when the slide leaves the slit. If this imperfection exists in a new camera, recently purchased, your best plan is to return the holder at once to the maker and have it rectified by him; but if the trouble supervenes in an old plate-holder, introduce a thin metallic spatula or knife-blade between the edge of the spring and the side of the slit, and thus scrape or rub off rust or other dirty substance from the edge of the spring. Next with a camel's-hair pencil or stout quill, brush away all the dust you can, and finally introduce a little olive or fine lard oil, or still better a little glycerine, all along the length of the spring, and rub it well in with a clean quill, that is, with the feather part of the quill.

This mode of proceeding will in almost all cases remove the trouble; if it does not, you will have to cover the slide with a dark cloth every time the slide is drawn out, or subject yourself to be troubled with *fogged negatives* all the time.

Let us now examine the shields respectively when in position. Place the largest shield, for instance, for the 8 x 10 plate, in its position, introduce a corresponding piece of plate glass, close the back and draw out the slide. See in the first place whether the glass is held firmly in its four corners by means of the spring behind it. If this is not the case, strengthen the spring by bending or otherwise until the glass no longer sinks from the corners by its own weight when the holder is turned so as to lie on its back.

Now let us see whether the surface of the plate glass is everywhere parallel with the surface of the holder. For this purpose we require in the first place a flat ruler, longer than the width of the holder. A steel square, two feet long and accurately of the same width of blade, is excellent for this purpose. Let the narrow edge of one leg rest across the surface of the frame that holds the plate from side to side, hold the other leg perpendicular. As it now stands, slide a piece of squared lath or a scale on the surface of the plate glass, which corresponds to the sensitized surface of the negative glass, and along the flat edge of the square, and examine minutely whether the distance from the upper edge of the steel blade to the surface of the glass is everywhere the same. This ought to be the case. If it is not so, you must remedy the imperfection, if you can, by elevating or depressing the corners, according to circumstances; but this is a troublesome business for one not accustomed to such work. You had better return the plate-holder and shields to the maker, and let him rectify his own work.

But we will suppose you find no imperfection of this kind in the first shield. The plate of the flat glass is removed, and the next shield, that is for the four-fourth plate, is introduced, and a piece of flat glass is put in its place, and the back is again closed. Repeat the experiment with the edge of the square and the scale as before; and to be correct, however, the distance here must not only be everywhere the same, but it must correspond with the distance obtained by measurement on the first glass. If this is so, the workmanship is so far perfect. The distances, too, with each successive shield must be the same all over its surface, and of the same length *exactly* with the first. This is excellent exercise for you; it requires care and refinement, but it will repay you for the trouble. If there is any inaccuracy in the correspondence of the respective distances of the shields, pack them up at once and return them. It is all very fine to say that a little inaccuracy of this kind won't do much damage: don't believe it; and besides, you buy the articles for perfect articles: let them be so.

Having found all perfect so far, your examination of the plate-holder and shields ends, and you proceed to the ground glass.

EXAMINATION OF THE GROUND GLASS.

The ground glass must be flat, a piece of thick plate glass. Take the glass out of the frame and see whether the surface is flat. This you can do with the edge of the steel square, or any other known flat surface. Frequently the ground surface is in a very rough condition, and on this account it is defective. Request of the maker to see to it that the ground surface is not only flat but perfectly *smooth*, but *not polished.* Put the glass, if found all right so far, in its place, and examine the distance of its surface with the square and scale, in the same manner as you did with the glasses in their respective shields. This distance, to be right, must correspond with that of the negative glasses exactly. This you can effect easily yourself by pieces of paper or card-board along the edges. Make the work right. Now we come to the camera.

EXAMINATION OF THE CAMERA.

Place the camera on a flat table, and examine in the first place the base-board, and see whether the four corners are perfect right angles. This is done by means of the square, of course. Next ascertain whether the front is perpendicular to the base, and its lower edge perpendicular to the two sides, by means of the square. Furthermore, see that the front is quite rigid in its place; if other necessary conditions have been found right, attend to the screw and make it rigid.

Now look at all the corners of the bellows-part to see whether by friction or abrasion small apertures have been made, and light is thus admitted. These little apertures are closed with a drop or two of melted India-rubber. Heat a small piece of an old India-rubber shoe in the flame of a spirit-lamp; the rubber will burn like sealing-wax, and the melted portion drops off. Let the drops fall into the aperture, and extinguish the flame of the drops.

Next shove up the slide to the front, and clamp it there; the back surface of the slide must be equally distant from the surface of the rigid front everywhere. Place the inner edge of one leg of the square on the front surface, and by moving the other leg of the square all round the sides and top of the front-piece, you can easily see whether this distance is the same or not. If it is not the same, the imperfection is too vital for you to meddle with; return the camera to the maker. Suppose, however, there is no imperfection of this kind, then draw out the slide to its full extent and clamp it. Repeat the operation with the square; clamp the slide also in the middle of its path and examine the distance. If the distances are all right, retain the camera: it is a good camera, a workmanlike camera; if all wrong, return the camera with your compliments.

In the next place, look again at the base-board of the camera and see whether it is constructed of one piece, or of a frame and panel. The former yields to different temperatures and *changes* its form; the latter is permanent and *retains* its form.

As regards the sliding front and the swing-back, there are scarcely any imperfections to be expected; of course you must know exactly the position of the sliding front, when the centre of the lens will coincide with the centre of the ground glass; and there must be a facility in restoring the front to this position when it has been once moved out of it. There must be also a distinct mark to indicate when the swing-back is parallel with the front, as well as two graduated arcs, to indicate the number of degrees deflected either vertically or laterally.

A camera, equipped as described and examined and found perfect, is just such a one as every photographer ought to possess. I believe they are manufactured to perfection by a Belgian (Ebéniste); and those that I have seen from the American Optical Company's works are *chef d'œuvres.*

EXAMINATION OF THE LENS.

Our first experiments must determine whether the lens has two foci, that is to say, a *visual* focus and a *chemical* focus. This experiment, of course, determines also the fate of the instrument.

Cut out a piece of inch stuff six inches long by three inches wide. On the upper and lower edge of the long sides find the centre.

Let a hole be bored at one centre, half way through towards the other centre, and sufficiently large to receive a round ruler that fits into the body of the common head-rest, the head part itself having been for the moment removed. On the upper edge, and at two inches from the central spot on either side make two dots; through these three points saw incisions into the wood at an angle of forty-five degrees, and insert three printed cards, containing the same words. Insert this top-piece into the top of the body of the rest, and place the piece of wood obliquely in front of the lens, so that the cards are parallel with the front of the camera; and let the cards be so placed that the same words are visible on each card. Now focus accurately upon the reading of the central card and take a negative. The result will show what we want to know. The three cards are nearly two inches apart. Now if the reading on the central card in the negative is quite sharp, as it was on the ground glass, whilst that of the one in front and of the one behind is equally sharp, but neither as sharp as the central, but still as sharp as either was on the ground-glass, then we conclude that there is but *one focus*, that there is a coincidence of foci for the yellow and the blue rays. Such a lens is said to be well corrected.

But we will suppose things turn out otherwise; we will suppose the reading on the back card is sharp, whilst the middle card is less sharp, and the front one almost illegible. From this we determine that the lens has not been properly corrected, that there are at least two foci, one for the yellow side of the spectrum and another for the blue, or, as we say, there is a visual and a chemical focus. Of course there may be any number of foci between these two extremes, and crispness or absolute sharpness of lines cannot be obtained with such a lens; and many of the lines in the negatives, which appear to the naked eye tolerably sharp, will become blurred or less sharp by toning or fixing.

But we determine still more from this experiment. It is evident that the visual focus here is shorter than the chemical; hence, if we wish to retain the lens and work with it, we must have a camera and shields specially devoted to its sole use; for now we must change the position of the ground glass, and bring it nearer to the back lens. By way of experiment, let the distance be shortened by the amount of thickness of a card-mount, and focus again upon the reading of the central card. Perhaps by this alteration the reading on the front card will be most legible. If so, diminish the thickness of the card-mounts, or place in their stead small pieces of thick paper. But if the reading of the back card, after the diminution of the distance in the first instance, should still be more legible than the central card, you must diminish the distance still more, and so long until the central card becomes most legible, and the cards in front and behind are equally sharp, that is, one as sharp as the other.

The general deductions are three in number.

1st. If the central card is most legible in the first experiment, the lens is correct.

2d. If the back card is sharpest, the lens is over-corrected, the visual focus is shorter than the chemical focus; and the ground glass must be advanced nearer to the back lens, in order to get an object sharply in focus upon which you focus on the ground glass.

3d. If the reading on the front card is the sharpest of the three, the lens is under-corrected, the visual focus is longer than the chemical; in which case the ground glass has to be put back, in order to get the object equally sharp on the ground glass and on the negative glass.

But now you must not misunderstand me, by supposing that the lens is corrected by making this change in the position of the ground glass. The error is still in the lens: it is an imperfect lens, and will do imperfect work; such a lens, too, is slow. Let us make use of a simile to illustrate this. A tree across the street has to be removed; the woodman cuts an incision near the bottom, and then five ropes are tied high up the trunk, and at the same point. One man locates himself in a window with one rope, which when tense is perpendicular to the trunk; a second man takes a second rope, and is placed in a lower window; and the other three with the ropes more and more remote from the perpendicular. The perpendicular rope does the most work, and the others gradually less and less as the angle becomes less than a right angle.

So it is with the lens; the chemical focus is the focus of blue rays: this is the perpendicular man; the foci of the other rays to the extreme of the red side, are the oblique ropes: they gradually do less and less work, until you get to the orange, yellow, and red, which do next to none at all, still they do some. Now if all the ropes can be taken into the upper window, so that they are all perpendicular to the tree, the men will all be perpendicular men, their forces will all co-operate with the utmost advantage, and down comes the tree.

In like manner, if all the foci of the different colored lights from the two extremes of the spectrum can be made to coincide, and to produce but one focus, the work performed by such a combined focus would naturally be very quick. Such a lens is a quick lens; and such lenses can be had.

Again, the self-same experiment with the three cards will tell you something about the *depth of focus* of your lens, something that is not yet thoroughly understood. For, if the reading on the three cards, after focussing on the middle card, is almost equally sharp on all of them in the negative, we say that such a lens has great depth of focus; but if the central one alone is sharp, and the other two scarcely legible, we say its focal depth is very small. Some people call this property *penetration*. Now, I am inclined to think that the best corrected lens has the least penetration, and that the terms, depth of focus, and complete correction or coincidence of all the foci, are incompatible with each other; and I think Dallmeyer is of the same opinion; for he *uncorrects* his estimable lenses in order to diffuse the focus, in order to get depth or penetration.

Is your lens a corrected lens?

You don't know.

Are your shields all in order, and your camera all right?

You don't know.

Then make the experiments, and see.

I am acquainted with a photographer who has been working to great disadvantage with all these things out of order; he could not comprehend the cause of his want of success; sometimes he attributed it to his silver bath; at another time to the rain-water, which ran from a pitchy roof; at another to the albumen with which he coats his glasses; then he thought the developer was the cause; next he lay charge to the skylight, to the background, to the reflectors and side-lights; in fact to everything but the right cause; he could not for a moment suppose his lens was wrong, or his camera, or his plate-holders: they had all been tested before he got them, but they were all imperfect. The lens, with a high name, has two foci; the visual is one-thirtieth of an inch less than the chemical. The slide of the camera did not move parallel with the front, it varied as much as half an inch at one corner; light, too, got to the sensitized plate, because the spring had got clogged. A complete overhauling has set him to rights. But he is enraged that his lens has got *two foci*, for he bought it from a first-rate house, who told him the lens could not be beat in any country. When he buys again, he is going to *look before he leaps.*

We might tell you a great deal more about the lens, but our article is getting already too long, and you would get tired.

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(Written for Photographic Mosaics.)

STUDY OF ART RECOMMENDED TO PHOTOGRAPHERS.

BY WILLIAM NOTMAN.

IT has been said that the image lies in the block of marble, only requiring the sculptor, with mallet and chisel, and educated thought, to knock away the superfluity of material, developing by degrees the preconceived form, till at length it appears in all its glory and beauty. But to produce this beauteous form, whether from nature in truthful simplicity, or treated with a dash of poetic grace, if the work is worthy of a sculptor's art, it will at once be seen that we require the material, the education, the sculptor.

In photography, alas, we too often have amongst its votaries those who have omitted one of the three requirements, *education.* Many have taken up the profession from mercenary motives, having neither any love for the art, nor if they had the love, have they the natural qualifications to insure success in it, meaning by success, the production of good works; for this class we have neither words of counsel nor any hope, but our wish is that the day is not far distant when their numbers will be but few. Again, there are others who have, either from choice or necessity, embraced photography as a means of living, but whose greatest desire and ambition is to excel in the art, and who have many feverish moments when beholding the works of men whose very thoughts and feelings find expression in their pictures, and whose every thought, from long culture and study of art and its principles, are so imbued thereby, that it is as natural to compose and arrange a picture accordingly as it is for them to breathe. While they look they are stirred to emulation; they try hard to produce such effects as they have been looking at, and fail. To all such I would say, try again and again. That you may the sooner find comfort and pleasure in your work, allow me to respectfully offer you a few words of advice.

First, I would advise you to study nature; study it constantly, closely, and patiently. Never suppose that you are perfectly familiar with it; the more you study it the more it will reveal itself and its true character: many look and do not see.

Study works of art: paintings, engravings, sculpture, and photography, all demand careful study; and when you examine a picture do not be content to pronounce mentally even a hasty judgment upon it, saying, Oh how beautiful, or the reverse, but take time. It will well repay you to study out what are its qualities first, lastly its defects; try every line: now this deep shade, this high light, this mass of half tone; find out if you can the purpose or intention of the artist in every particular, and if you have the privileged companionship of a more advanced student than yourself, exchange your opinions freely; the advantage of doing so is evident. If your home is in a large city, be grateful for the opportunities its galleries and art repositories afford you for study. If not so favorably situated, take every proper opportunity of seeing any private collections in the neighborhood, or of being introduced to their owners. Generally they are ready to receive kindly those who take like pleasure with themselves in studying works of art. Should no such opportunity be available, do not starve while so much art is to be met with in so many of the woodcut illustrations of the present day; first-rate art, too, let me tell you—fit to inspire.

Carefully read what books are at your command relating to art, perspective, composition, light, and shade. I am pleased to notice that photographic journalists have of late given these subjects more prominence, both in Europe and America. In the fifth volume of the *Philadelphia Photographer* a very useful series of papers will be found, entitled "Art Principles applicable to Photography." I would strongly advise any who are not in possession of such, by all means to obtain them. I refrain from giving any advice as to the mechanical appliances of our art. These have been, I think, so prominently brought before photographers, through the various photographic journals, that I fear it has been to the exclusion of papers on subjects relating to art, and which I deem of more vital importance; at least it would seem to me that photographers have been so engrossed with the *means*, that the *end* has been lost sight of. Having lately visited some of the principal cities in the United States, and their numberless photographic galleries, I am the better able to pronounce an opinion on this subject. Good work mechanically and chemically there was no lack of; ingenious, ready-witted, intelligent, in many cases apparently good business men engaged in the profession—men who *made* pictures as they would *make* boots or shoes, and who would be found invaluable in the developing-room as assistants—but the idea of art had never entered their heads; some of these we found doing a profitable buisiness, but not many of them, for those whose pictures were in most request, we generally found to be men who were fully conversant with art, and who thought and spoke much more of the effect produced than of "what collodion, what developer, etc., etc., do you use?"

But I must not be misunderstood. I have no intention to ignore studying chemistry in any of its relations to photography, but I place the study of art in all its relations thereto as much more important, and strongly advise this course to those for whom the foregoing remarks are intended.

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(Written for Photographic Mosaics.)

ADDITIONAL RAYS TO PHOTOGRAPHIC LIGHT.

BY DAVID DUNCAN.

Ray I.

I HAVE found the addition of loaf sugar to Selle's intensifier to be a great improvement; it makes it more uniform in action and consequently less liable to stain the plate. It keeps very well, likewise can be worked stronger without detriment to the "shadows"—say:

Red Prussiate of Potash,	15 grains.
Nitrate of Uranium,	15 "
Loaf Sugar,	15 "
Water,	1 ounce.

Ray II.

The following intensifier, well known to photographers, is valuable for copying, views, etc., viz.:

(*Solution No.* 1.)

Bichromate of Potash,	8 drachms.
Hydrochloric Acid,	1 drachm.
Water,	12 ounces.

(*Solution No.* 2.)

Schlippe's salts,	1 drachm.
Water,	2 ounces.

The plate is flowed with No. 1 solution, washed, and solution No. 2 applied until the required density is obtained. This intensifier has a tendency, however, to speedily fill up the fine lines of a negative of an engraving, but, by adding 1 drachm of loaf sugar to No. 1 solution and a little gelatine to the Schlippe's salts, it is rendered decidedly useful, and leaves the lines clear and sharp.

Ray III.

A small lump of gum camphor placed in a bottle of recently crystallized protosulphate of iron preserves it from oxidation. I have used a small quantity in the developer with advantage.

Ray IV.

A simple method of testing whether alcohol contains water or not, is to place a small quantity of gunpowder in a spoon, pour over it some of the spirit, light the spirit, and let it burn down to the powder. If the powder takes fire and explodes, the spirit is good. If it should remain in the bottom of the spoon black and wet, the spirit has been adulterated with water. This method is old, although it may be new to the majority of readers, and possibly be useful when other means of testing alcohol are unavailable.

Ray V.

By substituting glacial acetic acid for liquor ammonia in the albumen solution for coating glass plates an advantage is gained. It is an *excess* of acid that precipitates albumen. I have found its use to render the solution more bright and clear when filtered, acting as a preservative also. If the use of albumen for coating plates affects the bath at all, it is far preferable to use an acid than an alkali.

(Written for Photographic Mosaics.)

DRY PLATE WORK.

BY J. J. BARDWELL.

I HAVE been requested by my friend the editor of *Photographic Mosaics*, to write an article on the Dry Plate for that invaluable annual, which is used by many young in photography as a text-book, who look oftener for a formula than theory; and if I take the right view of the case, perhaps I would please more and give better satisfaction to the majority of its readers to stick to facts, or to such practice as I have found in my experience to work best, and to detail my mode of work, than to indulge in speculation. I have, it is true, had good success with many a different preservative, and have often thought it mattered little what process you used, provided you worked at it faithfully. In taking up any of the different processes, and working them up with care and patience, you will undoubtedly succeed. I should, however, recommend for a beginner to take the coffee process (and to stick to it till he was satisfied with the result before trying any other), for the reason of its simplicity, and the ease by which plates are prepared. Perhaps there is no process by which the beginner may be so sure to meet with sufficient reward as an encouragement to continue in the dry plate practice. After a day's tramp and exposing a dozen plates, and finding one good result, is better than I have done in the early days of dry plate practice. With the knowledge we now possess, it would go bad, indeed, if the novice did not succeed better than that. An experienced hand can now bring home twelve good negatives out of every dozen exposed under favorable circumstances. For a long time I have had the charge of a gallery on my hands, and of course had to attend to my business; but I used to prepare my box of plates in the evening, and on my way to my gallery would get a chance to expose a plate or two, and sometimes get a half hour's run of an afternoon. In that manner I have secured over two hundred negatives, some of which have been very valuable to me, with, I may say, little trouble or expense. To one who makes landscape photography a business, then, I should say, by all means use the wet plate; but even then as an auxiliary the dry plate is very valuable. A little coffee, white sugar, citric acid, and pyrogallic acid, are all the extra requirements. If I were going on a long journey, and wished to take a large number of plates with me, I should then use the tannin plate. With a common developer it is slow, but is very reliable, and can be worked with an alkaline developer very quickly; but as it requires more time and care, and needs greater experience in the preparation and developing, the process is not that which I should recommend to the beginner, nor to be used in an emergency.

In making a bath for the coffee or tannin process, I recommend the use of considerable acetic acid, and it little matters how much. I have used as much as one ounce of No. 8 to twelve ounces of bath solution without finding any bad effects; but any bath that works well with a wet plate will be satisfactory. The collodion should have a good body, giving a creamy film. With a thin collodion it needs the back of the plate to be coated, to prevent blurring, which will not happen with a creamy film. The plate should be washed with water, and while still wet flowed with the albumen solution and dried, before coating with the collodion. The coffee solution should be boiled after adding the sugar, for if not, on keeping the plates, the sugar will crystallize and make spots on the plates. If to be used within a fortnight, then a common infusion of the coffee and simply dissolving the sugar is sufficient. I think I like an infusion better than boiling, but why it should be so I cannot tell. White sugar, after being boiled sufficiently, loses the power of crystallizing. Brown sugar retards development, and tends to make the picture hard. The browner the sugar the less suited for this process. I have always found my plates, both coffee and tannin, to keep better, more free from spots and stains, and develop more evenly, when flowed with a solution of a bromide, than when simply washed. It has been said to render the plate less sensitive, but it is not so; the plates are in every way benefited by it, and I would advise no one to omit it.

In the coffee process, I would advise that the time of exposure be always enough without resorting to pushing, for many times on making the second application of the developer a transparent and almost invisible fog will sometimes overspread a portion of the shades, and more especially among the finer detail of the negative, so far as to destroy its printing qualities. I have never met with the same effect in working any other process. The color of the coffee plate is very nonactinic, and care has to be taken in developing not to carry it too far. A good coffee negative has printing qualities not excelled by any dry process that I have ever tried. The tannin solution will keep for a long time. I have a large bottle of it by me that I have had several times to remove an accumulation of fungus that seems to grow and prosper in spite of carbolic acid, but makes excellent plates and is over two years old. I never keep a coffee solution, it is so easy to prepare. I have never observed that it made any difference in the kind of coffee used. My experience is that the plates should be dried quickly and well, and I therefore always dry in a warm room and quite close to a hot stove. It has been recommended to use an iron developer with coffee plates, but my advice is to use the pyrogallic developer. In my hands it has always proved the best and most manageable. In using a substratum, I have found gelatine to be best for tannin, but for the coffee plates I have had better success with thin albumen, say 1 ounce of albumen to 16 or 20 of water, adding a small quantity of ammonia. The tannin acts on the gelatine and forms a combination with it. But with coffee it will sometimes slip as if no substratum had been used. The albumen solution can be used by moistening a piece of cloth with it and just running it around the edge of the plate for an eighth to a quarter of an inch all around on the side to be coated; it will dry almost as quickly as done, and will many times be quite sufficient. There are many valuable uses to which the dry plate might be made available in our gallery practice, especially in enlarging, and in multiplying negatives, and in making slides for the magic lantern. For instance, your having a carte negative of some subject for which on a sudden there is a large demand, say two or three thousand copies, and at the same time an order for copies of the same, 4–4 size. You make a transparency on a dry plate, of which you are supposed to have a supply, or if not, could soon have some ready, and from that transparency make a sufficient number of negatives as perfect in all respects as the original, so as to print in one or two days all required to fill the order. To make the 4–4 negatives, the transparency is copied in the camera, as many operators make opal pictures. Some find a deal of trouble in copying maps, drawings, and such like, from a difficulty in obtaining a sufficiently dense negative to make a good copy, sharp in its lines, and at the same time to give good whites; for such purpose the dry plate is excellent. The intense sharpness and fineness of the deposit on a tannin plate renders it very valuable for microscopic purposes. The dry process has not been looked upon with much favor in this country except by a few, but of late many have tried it, and with considerable success. To those contemplating working in this line I would say, that the back numbers of the *Philadelphia Photographer* and the *Photographic News Almanac* contain all the various formula for the many different dry processes, together with the mode of working the same in detail; and on making up your mind, the process you wish to try, stick to it till you have the same mastered. Work hard, have patience, and stick to one process, and you will soon succeed to your entire satisfaction.

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THE GOLDEN SYRUP SOLUTION FOR WET PLATES.

BY H. P. ROBINSON.

THE only chemicals necessary to take into the field are, the silver bath, collodion, iron developer, and syrup. Of the first three I need say nothing; every photographer knows how to make a negative bath, whether he uses nitrate of silver hermetically sealed in glass tubes, at a high price, strongly recommended to tyros, or the quite as efficient, and, probably, the same, silver at three shillings and five pence, commonly employed by more experienced hands. All commercial collodions are now so good that it is difficult to buy a bad sample; the most important thing to see to now all are so good is, that it has attained the right degree of *ripeness*. The iron developer I use is from fifteen to twenty grains, without organic matter or other restrainer than acetic acid. The syrup is made as follows:

Golden syrup,	10 ounces.
Water,	10 "
Alcohol,	6 drachms.

A plate is prepared, exposed, and developed in the usual way. When the image is fully out, the developer should be poured off, and the syrup poured on, after which the plate must be put away in a light-tight box. Tin or zinc boxes are best when the plates have to be kept a long time. I have kept preserved plates in a wooden box for three days without any detriment. I have no doubt they would keep much longer.

It will be observed that I recommend the negative to be developed only, not intensified: that operation had better be performed at home.

There can be no doubt that a negative exposed for exactly the right time will yield better results than one over or under-exposed; but with the preservative, as with water, there is some latitude of exposure allowable. When the wet process is conducted in the usual way, if the plate is under-exposed, a prolonged application of the developer will often bring out sufficient detail; when it is over-exposed, the developer is washed off quickly. So with this process, if the exposure has been too long, a quick and skilful application of the syrup will save the plate. It is a curious property of golden syrup (on which this process partly depends) to immediately arrest development. It does this so surely, that if there was the least particle of the film without any deposit when the syrup was applied, it would most certainly remain bare glass, however much the negative may be afterwards redeveloped or intensified. It is impossible to fog it.

From the few failures I have heard of, there appears to be some little difficulty in applying the syrup. It should be poured over the film in a freely flowing wave, covering the plate all over as quickly as possible, just as the developer is applied. If the alcohol in the syrup does not exactly balance the alcohol in the bath, the syrup will not at first take to the surface of the film, but will present a slightly greasy appearance. This is of no consequence at all, but the syrup must be worked over the plate for a short time until it runs evenly. It should then be poured off, and the plate boxed. In my practice, I have taken no care to prevent streaks and stains, and have never seen any, even in the most delicate sky and sea negatives; but I would recommend a beginner to take all the care possible.

The negatives may be intensified and fixed at home at any convenient opportunity within a few days of their being taken.

To intensify, wash the plate thoroughly under a tap (the longer it has been kept, the more washing it will require); pour the intensifier, either pyro or iron, over the plate and back again into the measure; now add a few drops of nitrate of silver solution, and carry the intensification to the requisite degree. It will be found that this takes place quicker than in the ordinary method, and that any degree of intensity can be obtained with the greatest ease. Wash, and fix with hypo.

I have entered minutely into the details of this very simple process, because I have a great objection to suggesting anything that may mislead others; and it is almost as easy to mislead by a partial statement of a process as by a misstatement. I hope those who fail at first, will really try again, and, if they carefully follow the above instructions, I feel sure they will succeed.—*Photographic News.*

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ON INTENSITY.

BY R. D. EWING.

SOMETIMES there is difficulty in procuring sufficient intensity in the negative; at other times there is a tendency to too much of it. Let us consider these two states of the negative in their order.

I. *There is a Want of Intensity.*—It will be well here to take into consideration the various conditions that tend to thinness in the negative; these may be attributed to three principal causes:

A. *The light and temperature.* B. *The state of the bath.* C. *The nature of the collodion.*

Over the first (*the light*) we have very little control. In very dull days, or in days when the sun is obscured by a yellow fog (as in Indian summer), it is often difficult to obtain sufficient intensity. The only remedy we would suggest would be a wide diaphragm and plenty of exposure; even the use of an intense collodion does not avail very much, since it generally increases the tendency to hardness. It will be best, when things are in this state, to look well to the diffused light in the operating-room. I know of nothing so detrimental to a proper gradation of light and shade in the negative as a flood of diffused light pouring down between the camera and the sitter. Remember, as much as possible all light should be directed towards the subject. Carefully shield the camera from sunlight, and even from direct top or side light. If, during the present summer weather, you have a flood of light pouring down from above, as strongly directed towards the camera as from it, you can expect nothing but poor negatives, thin and weak and inclining to fog; so arrange sloping blinds that the camera will be as much in darkness as possible, and your model well and judiciously lit up.

The *temperature*, too, has a great influence on the intensity. With the thermometer below 50° you must use artificial means to produce heat. Nor is it of much use to warm the bath alone; you must also make the dark-room, solutions, and the glass-room also, all of a comfortable heat. If you are sure that all these conditions have been attended to, you may then proceed to consider the state of our second heading.

B. *The nitrate bath.* In winter the bath should never fall below forty grains for our collodion. In summer it may well be allowed to fall to say thirty-five grains. Nowadays, that all collodions contain more or less bromide, a stronger bath is required than formerly, and the more bromide in the collodion the stronger the bath needs to be. In summer, however, the film is more readily sensitized; and as there is a great tendency to streaks and stains in hot weather, it will be well to work with a bath not too strong when the temperature rises high.

The amount of acid in the bath has a considerable influence on the intensity. A neutral bath always gives a stronger deposit (other things being equal) than an acid one. A very acid bath never yields an intense negative. If the bath is at fault, or supposed to be, concerning the intensity, I should proceed to test where the fault lay in the following manner: 1st. By the hydrometer ascertain the strength. If in winter I should make up to forty grains or above; in summer I should be satisfied with thirty-five, or even less. I should then test for acid by dipping a piece of litmus paper in the bath; if it reddened very quick and very red I should say it was too acid, and add a few drops of a solution of carbonate of soda to partially neutralize, and filter. But if the litmus paper reddened but slowly, taking from one-half to one minute to turn the paper of a purple-red color, I should say it was just right; on the other hand, if it did not redden the paper at all, I should say a drop of nitric acid would do no harm. The above are general directions for testing the state of the bath; of course, they presuppose the bath otherwise in good condition. They may be summed up in the few following words:

A bath will yield intense negatives when—

1. It is in proper order, yielding a clear, clean, transparent negative.

2. When the temperature is not below 55° nor over 70°.

3. When it is at least forty grains strong in cold weather, and thirty to thirty-five in warm weather.

4. When it is not too acid nor yet too alkaline.

There is still another condition of the bath when it is difficult to obtain proper gradation in the negative, even when to all appearance proper precautions have been taken, and that is when the bath is just on the balance between good and bad; often, when a bath is in this condition, the light being good and the subject good also, you get a splendid negative, but, perhaps, in an hour you fail to please yourself completely. If you expose short, they come up chalky; if long, the tendency is to fog. If you have it to appearance all right, only weak, and you try to strengthen, you stain or fog, and cannot help it. Generally the bath requires complete overhauling, and may be put in the category of a disordered bath.

Better make a new bath in a case of this kind than repair the old one, since nothing satisfactory will be likely to be got from it.

C. *As to the influence the collodion exerts on intensity.* Bad collodion is simply *bad*—no remedy for that.

But collodion may not be bad that does not yield intense negátives; indeed, it is often the best collodion that is least intense. It may be premised that almost all collodions contain enough iodizer, so we will not advise an addition of that. But new collodion is less intense than old, thin collodion than thick. You may improve it, then, if very new, by adding some old collodion, and, if very thin, by adding some more gun-cotton, or mix with a thicker collodion. Sometimes a new collodion, not too thin, may be made to yield quite intense negatives by simply adding a few drops of the tincture of iodine or even a drop of acid to the bath, since these additions have a tendency to prevent fog, and allow of a longer exposure and longer intensifying with the developer without veiling. On the same principle collodion always gives more intensity as it gains age, since it admits full exposures and full development without staining.

We omitted to mention the influence of the developer in regulating the intensity. But we have alluded to this so frequently as to make it almost unnecessary. We will just briefly state a few things without explanation in this place.

A strong developer with little acid favors thinness.

A strong developer with much acid is more favorable to intensity.

A weak developer always favors intensity; the more the acid the more intense the negative.

Moving the developer on the plate tends to intensify.

Keeping the developer perfectly still on the plate tends to fulness of detail and thinness.

The developer may be made to yield more intense negatives by the addition of a little gelatine. It will be well to know how to do this.

To one ounce of acetic acid add half a drachm of Nelson's patent gelatine and allow to dissolve, shaking frequently for a few hours. You will have at hand a solution of the utmost value for regulating the intensity. Remember that one drop of this solution is equal to ten drops of pure acid, and be guided accordingly. If you wish to prepare a developer that will yield an intense negative —a copy for example—add to the usual iron solution half the usual quantity of acid, and from two to six drops of the *aceto-gelatine* solution to every ounce of developer; it will very much increase the intensity. You must be guarded, however, in the addition of this, since but little need be added to produce a great effect.

The other part of our subject—too much intensity—we will leave for our next. Again: we must explain that our imperfect notes are not intended as guides to the finished photographer, but to his younger brother, the beginner; if they bring to the memory, however, of the more accomplished something he has for the time forgotten, perhaps he will excuse us for introducing them here.—*Canadian Journal of Photography.*

POSITION OF THE STUDIO.

BY OTTO BUHLER.

THE first point to be taken into consideration in the erection of a glass-house is its astronomical position. We mean thereby the angle which it should make with the meridian of the place, or, in other words, the placing of the principal window in regard to one of the four quarters of the heavens.

A studio in which the direct solar ray falls at any one of those hours of the day when it is usual to photograph has always its disadvantages. It is not only necessary in such cases to make extensive arrangements in order to divert the disturbing light, but requires a very practised eye to recognize and obviate its prejudicial influence. And that is not enough: the intensity of the light changes so frequently, and often in such studios becomes so steep, that long practice is requisite to ascertain the proper time of exposure in each particular case. If, therefore, the locality admits of it, let it be (at least, in our latitude) where the sun itself at midday of the summer solstice does not stand (for any time) above 66½° above the actual horizon. The studio should be so built that during the proper hours for photographing it is perfectly inaccessible to the direct solar light. There are certainly many studios where the solar light is intentionally admitted, and many artists know even how it is possible to obtain excellent effects in a studio with full solar light; but the artistic endowment which can work under such circumstances is rare and the practice it necessitates very long. We advise, therefore, the safer and far more convenient way; for the difficulties in photography are quite sufficient, and there is no occasion to increase them intentionally.

On the northern half of the earth's sphere only the north side of the heavens is free from sun, and thence an even proportion of light is imparted. No remarkable change in quantity or quality is experienced, and hence it is that painters make particular choice of a north light for lighting their studios and models. The north light influences photographic plates in like manner, just as the dispersed light does at any time or any other spot of the firmament, and beyond the great advantage which its repose and evenness are in the studio (imparting a soft and harmonious modulation of tints), it balances the disadvantage of a slight difference in the time of exposure necessary in consequence of its somewhat less intensity.

The photographer will therefore so place his studio that the back of the model is turned towards the south and its face towards the north; and the normal light can always be let in, as occasion requires, from the northeast or northwest, whilst the pure north light serves to render it clearer. In cases where this is not possible, let the normal light enter from the north, and turn the back of the model, as required, either to the southeast or southwest. Some prefer the one and some the other.

This is not all. Care must be taken that the studio be sheltered as much as possible by high walls, etc., from the solar light in the south. In winter—that is, during the winter solstice (21st December)—the sun at midday does not reach higher than 28½ degrees above the actual horizon, or 66½ degrees from the zenith, and the point of sunrise and sunset lies more towards the south, rising at east-southeast, and setting at west-southwest.

At the time of the spring equinox (21st March), the sun rises exactly in the east, at noon is about 45 degrees above the horizon, and sets exactly in the west. It is the same at the autumnal equinox (21st September); but from that time the sun always moves farther forward, so that on the 21st June the sun rises at east-northeast, at noon culminates in an angle of 66½ degrees, and sets in the west-northwest.

DIRT.

BY EDWARD L. WILSON.

WHAT is dirt? Dirt is one of the special friends of many photographers. It is a chronic *disease* with which they are afflicted—a *sickness* which they seem to enjoy, judging from their work. It has been defined by some one as "matter out of place," and such it really is in photography. It intrudes itself where it is not wanted, and like as the "spirit" in a photograph clings to the subject and spoils the looks of the picture, yet creates the most diligent inquiry as to what caused it to be there, so dirt clings to a man's work, spoils it, and puzzles him greatly to find out where the mischief is, and how it occurred.

Some people though cannot work without dirt, it would seem. They are never so happy as when they are in it. They never try to battle with it, and drive it away. O no! that would deprive them of their daily excitement,—get them out of the vile rut or groove in which they have rolled over and over, in a straight, backward line, ever since they " made ''garatypes' in 1840."

Let us hope, however, in what follows to impress them with the fact that dirt is their greatest enemy. Now if this be so, where do we find it, and how shall we get rid of it?

In answer, let us contend that dirt *is* "matter out of place." It is, therefore, the cause of all bad results in our manipulations;

and it is so subtle, that nothing but the utmost care and cleanliness and watchfulness will rid us of it.

It begins with the plate. You are in a hurry. You hastily cleanse a plate, coat it, sensitize, expose, develop, wash, dry, varnish, and then the dirt shows itself,—provided you will look, for its effects are plainly visible.

It being the first plate you have coated that day, you have forgotten to remove the film from the surface of your bath, and it has consequently left its marks on the negative; your collodion was over-iodized to harmonize with your bath, and hence you have a weak and harsh negative; your developer, which was probably left uncorked, or the iron from which it was made was left open in a paper where dust and sprinklings of other chemicals could get at it, and the result is *more* stains playing all sorts of antics over the plate; you see this, and apply a liberal supply of water. No use.

Now you fix your negative in hypo, and wash hastily and imperfectly. You know better, but that is your habit,—that is the rut you roll along in; so no matter. The plate is dried, and while warm you varnish it. No matter if the varnish is a little dusty. You forgot to cork it,—go on. Now look at the resulting plate. It is a monument to dirt, erected by your own hands. You began with an unclean plate. You were fortunate in getting the film to adhere to it at all. Your perspiring hands not only left their marks upon it, but the plate was not well cleaned; hence while the varnish is setting the film rises here and there, like the earth during an earthquake, in little ridges; these fall, and in falling break, leaving irregular, serpentine lines over the plate. The imperfect washing would have caused such lines in time, had your plate been ever so clean to begin with; but other dirt superseded it, though if the poor thing lives it will show all sorts of disease in time—simply the result of dirt.

Now we need not go through a long line of manipulations to show what are the effects of dirt, and when it stealthily crawls in upon you. Many men know they are dirty in their working. It would be presumption to try to teach those who *know* it; but for the benefit of those who *desire* to do good work, and who are often in trouble as to what causes their drawback, let me state that the principal cause is *dirt*, and I will tell you where to find it, and what it is. The following may be called dirt: Impure water in the nitrate bath; the developer when it lacks acetic acid; old pyrogallic acid that has been left to stand in solution with water; white light on the plate before development in the camera or in the dark-room; sunlight falling directly on the lens; impure air; the fumes of ammonia in the dark-room; sprinklings of hypo and iron on the floor of the dark-room; dampness; streaks on the plates, caused by not keeping the plate in motion while in the nitrate bath; hypo is dirt after it has performed its offices; an unwiped plate-holder; hands unwashed between each manipulation; blowing the breath on the plate just before coating; a film too dry before being dipped; stoppage of a plate when entering the bath; the developer *dashed* on the plate; getting out of temper; fingers on the albumenized paper before printing; dust on the negative; light upon the prints before toning; dust on the surface of the wash-water; old hypo fixing solutions; dust flying about the prints when drying;—all, *all* these are dirt, and hundreds of other things. Lack of watchfulness is dirt, because it causes it.

If you have a dirty plate, lay it down carefully on a table; remove all foreign substances from it; then take a hammer, and smash it deliberately to pieces. So treat dirt, whenever and wherever you find it. It is your worst enemy.

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SURFACE STAINS AND MARKS ON NEGATIVES.

IN one of our "answers to correspondents" last week we referred to the fact that we had received no fewer than three letters during the previous week on the subject shadowed forth in the heading of this article. Since we wrote that reply we have received two more letters on the same subject, and we are thus reminded of the old saying, that "it never rains but it pours."

The stains which thus appear to have set in as an epidemic are of a superficial nature, and may often be rubbed completely off. Their shapes are rather whimsical, and appear as if a kind of scum from the bath had settled on the surface, and reduced the silver in the form the scum had assumed. From all that we can learn—certainly from the evidence furnished by the communications we have recently received on this subject—these stains appear to be much more prevalent during hot than in cold weather.

After some investigation of the subject, we recommend persons thus troubled to try the following experiment: After the plate has been collodionized and excited, allow it to stand in a vertical position for a few minutes, as it would do if placed in the slide; and then, without exposing it in the camera, pour over it the iron developer. In all probability the stains will appear as usual, showing that they are not necessarily dependent upon the influence of the dark slide or camera.

Having established this fact, proceed to coat and excite another plate, and allow it to stand as in the former experiment. Now examine the surface very carefully, and it is more than likely that markings will be discovered, similar in outline to those which will afterwards appear, more strongly marked, when the developer is applied.

In several instances we have known these markings to be produced in consequence of the contact of the plate with the holder. Quite unlike the results of the former experiments, we have seen the plates remain quite clean under the action of the developer, but becoming stained with the surface deposit in question only after they were placed in the slide. This has, we are aware, been observed by many other experimentalists, and establishes the fact, that in certain circumstances the contact of the holder induces the conditions under which the deposition takes place. It is of no consequence that the plate-holder has been carefully varnished; this but serves to aggravate the evil in some instances, for, having compared the results obtained from the use of a holder having a set of old, well-stained corner-pieces with a similar holder carefully varnished, the latter was, if anything, the worse.

The physical nature of the collodion has much to do with surface markings. A hard, skinny, or repellent collodion is more conducive to the evil than one of a more porous and non-contractile nature.

A scum is sometimes formed on the surface of the bath, which is so delicate as often to be scarcely observed, but which favors the reduction of the silver in the form in question.

Keeping the plate too long after removal from the bath and before developing, is also favorable to the production of these markings.

Having thus stated several predisposing causes, we proceed to point out the obvious remedies.

1. If the collodion be too horny, add a *very* small quantity of distilled water to it. Ammonia has a powerful influence upon the physical constitution of collodion. Carbonate of soda we know to be exceedingly useful under certain circumstances.

2. If with a really good and suitable collodion the plate dries unequally, rinse it in distilled water previous to development, and then pour over the surface a twelve or fourteen-grain solution of nitrate of silver which has not been used for ordinary bath purposes.

3. Prevent an accumulation of bath solution on the lower end of the plate by means of blotting-paper, which will absorb it. Place the blotting-paper in such a manner as to prevent the sensitive plate from getting into direct contact with the holder of the dark slide. A small piece of blotting-paper placed at each corner will, in nine cases out of ten, effectually prevent the markings in question from being formed.

4. Do not allow the plate to remain too long in the exciting bath, and do not keep the plate longer between sensitizing and developing than can possibly be avoided.

5. Keep a careful watch over the surface of the bath, and draw over it, now and then, a bit of very clean paper, by which any incipient scum will be removed.

By adopting one or other of these precautions, the evil of surface markings will be entirely prevented. We have, of course, presumed that the operator has kept the bath up to the proper strength and in good working order *otherwise;* for in the foregoing we have referred to only one class of stains, namely, those white, superficial "mat," "oyster-shell," "fortification," "arabesque" deposits, with which, we suspect, the majority of photographers are too intimately acquainted to call for more elaborate description at our hands.—*British Journal of Photography.*

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CARBOLIC ACID IN THE PRINTING BATH.

OUR attention has more than once of late been directed to the advantages of carbolic acid in the printing bath by correspondents who have tried it. The addition of 3 or 4 drops of the pure acid to a pint of the silver solution will, it is stated by more than one of our readers, arrest the tendency to form scum on the bath, will check discolorization of the solution, and retard the tendency in the excited paper to become brown on keeping a little time after sensitizing.

The tendency in the printing solution to turn brown in the dark, and the readiness in sensitized paper to acquire a similar discoloration without the action of light, are always promoted by any disposition in the albumen on the paper to decompose; indeed, any tendency to decomposition in organic substances in combination with silver, facilitates the reduction and consequent darkening of the silver. Carbolic acid is one of the most powerful agents in checking or arresting decomposition, hence its action in preventing discoloration and scum in the silver solution, which, having been in contact with the albumenized paper, has generally dissolved more or less of it, and also in checking, if not entirely arresting, the discoloration of sensitive paper when kept in the dark.—*Photographic News.*

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SILVER RESIDUES.

GREAT misunderstanding appears to exist on the subject of wastes, both as to the mode of saving them and also as to their value when saved. Nor is it to be wondered at, since very little has been written on the subject, and what has been written has been either too prolix for the general reader or too general and not concise and particular enough.

And first, as to their value. Chloride of silver ranks highest in this respect, yielding from fifty to seventy-five per cent. of its weight of pure silver, worth from one dollar to one dollar thirty-five cents per ounce.

When the chloride is less pure or not sufficiently washed from the salt the value is much less, possibly not yielding more than thirty or forty per cent. of silver. Paper clippings, properly reduced to ashes from filters, etc., yield from ten to forty per cent. of pure silver, according to the strength of solutions they are saturated with and the cleanliness with which they have been saved. A few minutes devoted to the study of this important branch of photography will not be misspent.

1. Then it is of the utmost importance that paper clippings, filters, and all papers impregnated with nitrate or chloride of silver, should be saved in as pure a state as possible—free from pins, pieces of ferrotype plates, dirt, clay, nails, glass, and indeed all foreign substances. Metals deteriorate the value of the reduced silver very much, and mixed with the ashes give a false idea of their weight, and the seller has a fictitious idea of their weight and value, consequently is disappointed, not from any fault in the refiner, but from his own carelessness in collecting the residues. There is another thing, too, worthy of notice. All paper, not impregnated with silver, should be carefully kept out of the stock, since they produce simply paper ashes of no value, are bulky in the refining-pot, require more flux, more fusing, and consequently add greatly to the expense of reduction, and thereby diminish the returns. Nay, they do more; they are positively deleterious, and very much lessen the value of the ashes. I have no hesitation in stating that if a pound of good ashes are mixed with a pound of useless ashes the returns will be reduced one-half. When the ashes contain much useless material, the flux in the melting-pot, instead of being thin and flowing, is stiff and pasty, and it is difficult in the extreme to separate the small granules of silver from the stiff pasty mass. *See, then, that all your paper savings are kept clean, if you wish to get the best value from them.*

2. In what state are they best sent to the refiner to get the greatest returns? I answer, carefully reduced to ashes. It takes considerable time and attention to do this, and as it is not much trouble nor difficult to do, you had best do it at home. A wood stove does it capitally. Carefully clean out the stove, then take a handful of the *dry* silvered paper, and lay it in front on the bottom of the stove; set on fire, and then carefully feed as it burns down; be cautious so to regulate the draft that none goes up the chimney. When it is all burned stir well with a piece of iron, to allow the air to get free access to the charred mass, and allow to remain in the stove till quite reduced to ashes. Remember, as I stated before, that charcoal from the paper very much reduces the

value of the ashes by adding to the expense of refining. When cold you can weigh them, and they are ready for sending to the refiner. You can send ashes by express, or even mail, for one-tenth the price you could send the paper itself. The paper is very bulky, the ashes not so.

Another thing worth knowing is that a small quantity is not so valuable in proportion, other things being equal, as a large one. I would never sell less than half-a-pound of ashes at one time to gain the highest price.

3. Great care seems to be the rule in all photographic operations (*we ought to be patient men*). In saving your chloride from the nitrate, you cannot be too careful. Make a saturated solution of common salt in water (*hot* water is best). This ought to be filtered through a piece of cloth into the old silver solution you wish to reduce, the stronger the silver solution and the stronger the salt solution the easier the operation. When they are weak, the chloride is light and very difficult to collect. When they are strong, you will be surprised to see how stiff and firm the resulting chloride is, and how easily separated from the liquid around it. Continue to add salt solution till no more chloride is thrown down. To be sure of this (after having thoroughly stirred the mass and allowed to settle), pour off a small quantity of the solution from the top into a clean glass; add to this a few drops of the salt solution. If no precipitate is formed you may conclude it is all turned into chloride, and proceed to wash away the nitrate of soda from the chloride of silver. Pour carefully off the clear portion, and pour boiling water on the chloride remaining: stir well; allow to settle; pour off, and repeat two or three times; *it will then be* ready to dry and weigh. Collect carefully, for this pure chloride is valuable.

Things to observe: Have your nitrate solution as strong as possible. Have your salt solution very strong; add enough salt to precipitate all the silver, and wash (for ease) with warm water.

4. To save the chloride from your print washings, procure say a ten or twenty-gallon cask water tight; take out one end, about one-fourth from the bottom, or, better, about the height of a pail; insert a wooden tap, price ten to twelve cents. This is your apparatus. At the tinsmith's procure say five pounds of clippings of zinc; fling them into your barrel; it is now ready. When you are about to tone throw in your first and second washings from your prints, and drain the prints each time to the last drop. Now

and then add a handful of salt; stir the contents of the barrel daily. When nearly full, allow to rest for twenty-four hours, and then, without stirring, but tapping the sides gently to detach any portions of chloride adhering, draw off the liquid down to the tap, and throw away. Proceed to fill up anew; continue this for six months or a year, and you may then turn out the contents, first baling carefully off the water, and then collecting the dirty mass of nearly pure silver at the bottom on a strong filter to wash and dry.

Observe: Never stir the contents of the barrel for at least twenty-four hours previous to drawing off the liquid at the tap. Tap gently on the barrel all round an hour before emptying off, and see that you have always enough salt and zinc to reduce the waste silver from the solution.

5. The developer solutions, drained from the plate, are worth saving. Develop over an earthenware or gutta-percha flat bath; pour the savings each evening into a large bottle, with a little salt to perfect decomposition. When full, proceed, as in the case above, to pour out the useless liquid at top, reserving the precipitate at bottom for further treatment. When you have a quantity of residue throw on a filter to get rid, by careful washing with hot water, of the salt and iron.

Unwashed developer drainings, simply dried, consist principally of iron, and *are worse than useless* for the purpose of refining. It is simply a waste of time, crucibles, fire, and flux, since it produces no return. Remember, the more and purer the silver solutions to be reduced the less fire, labor, fluxing material, and the fewer crucibles it requires, and consequently the less expense is entailed and the greater the returns.

Pure residues, however small in quantity, will always yield some return. A large quantity of impure residue, though yielding considerable silver, may make no return, since the cost of refining may be so great as to swallow up all the proceeds.

Within the limits of this article it is not possible to include all the means of saving practicable. Let me urge, in conclusion, save what you do save in a cleanly manner, free from adulteration, in the smallest bulk, to obtain the best returns.

Residues from Toning Baths.—Have two bottles that will contain half-a-gallon each. Into one pour the used toning baths till nearly full. Then dissolve two drachms protosulphate of iron in an ounce or so of water, and acidulate slightly with muriatic acid. Add this to the bottle of toning solutions; shake well. It will immediately turn nearly black. Allow to rest for twenty-four hours; tap the bottle slightly, to precipitate the particles of gold adhering to the side. Permit to rest a few hours, to allow all to fall to the bottom; then pour off the clear portion. This bottle may be refilled many times in succession before collecting the wastes. The use of the two bottles is to allow time for precipitation after adding the iron before pouring off. By using them alternately all the gold may be saved very easily. When you wish to collect the residues pour all on a filter; wash thoroughly with cold water, then dry it for sale. If for use, you need not dry, simply re-dissolve. Precipitate with iron once more; wash well; dissolve for the last time in *aqua regia*, as at first, evaporate nearly to dryness two or three times, to get rid of the acid, and it is ready to make the toning bath again.

In these dull times and low prices every penny saved is surely a penny gained. Save your wastes.—*Canadian Journal of Photography.*

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POISONING BY CYANIDE, AND ITS ANTIDOTES.

EVERY photographer knows that if the iron developer, in the course of his manipulations, comes into contact with cyanide of potassium, a decomposition ensues in which Prussian blue is formed; and a similar action takes place in the stomach: the deadly poison is neutralized, and a harmless compound formed in its place.

The exact decomposition is effected by a solution of iron, containing a persalt in the proportion of four equivalents to three equivalents of a protosalt. An excellent paper, published some time ago in the *Pharmaceutical Journal*, entered into detail as to the most efficient preparation for exhibition in any form of hydrocyanic poisoning, giving some striking instances of its value as an antidote. We subjoin the details as then published, and we recommend every photographer to preserve them for ready reference, always remembering that a simple solution of sulphate of iron may be given without a moment's delay:

Prussic Acid Antidote.—Take of liquor of perchloride of iron 87 minims; protosulphate of iron in crystals, as pure as possible, 25 grains; as much water as will make a solution of a protosesquisalt of iron, measuring about half an ounce. Dissolve, on the other hand, 77 grains crystallized carbonate of soda in about half an ounce of water. These quantities destroy the poisonous action of between 100 and 200 minims of medicinal prussic acid, officinal strength, on giving first the one liquid and then the other.

Antidote for Cyanide of Potassium.—The antidote for this compound is the same as for prussic acid, except that the solution of protosesquisalt of iron is to be used without the alkaline solution, the prussic acid being already combined with an alkali; the use of the alkali, however, would not be injurious; a harmless yellow prussiate would be formed. In this case, in consequence of the possible presence of free acid in the stomach, the alkaline liquid should be given first. The quantities given as the prussic acid antidote would decompose 35 grains of cyanide of potassium.

To be suitable for the antidotes, the liquor ferri perchloridi must answer to the following tests: One fluid drachm must contain 15.62 grains peroxide of iron; ammonia must give a pure reddish-brown precipitate, without any shade of black; it must not smell strongly acid, nor, after slight dilution, give a brisk effervescence with a piece of zinc.

Once more we repeat our advice: Banish cyanide from the laboratory, especially for regular use. If a small supply be required for occasional purposes, let it be capped, tied down, duly labelled, and placed in an inaccessible part of the establishment, where it cannot be taken by accident, and not easily by design. Further, let every person in a photographic establishment be familiar with the simplest remedies for the poisons commonly employed in photography. Indeed, a sheet of simple instructions how to deal in such cases ought to be hung up in some part of the establishment accessible to every one. We do not write in the spirit of alarmists, nor do we affirm that under ordinary circumstances a photographer's studio contains more elements of danger than most establishments; but surely the proposition is a simple one, that wherever agents destructive to life are accessible, and may be taken by accident or intention, the remedies should at all times be equally accessible, and the means for rendering them available made easy and certain.—*Photographic News.*

OBSERVATIONS ON THE EMPLOYMENT OF BATHS OF VARNISHED WOOD.

BY M. CLOUZARD.

(Read before the French Photographic Society.)

THE first wooden dish of which I made use was a failure, the varnish and glue with which I had coated it being removed by the action of the silver bath, even at a cold temperature. I had used considerable care in its construction, especially in the application of the varnish, but by degrees the moisture penetrated the varnish, attacked the glue, and dissolved the latter away. Being thus convinced of the unsuitability of glue, I devised a mixture which should be more appropriate, consisting of one part of marine glue, and four parts of shellac sparingly dissolved in wood spirit. Besides adopting this mixture, I also took the precaution of fastening the wooden vessel with copper nails instead of iron ones, the latter being more liable to be acted upon than the former.

To make the vessel more solid, to prevent the liquid from filtering through the crevices, and also to render the bath more convenient to clean out, I fastened, by means of the same compound, triangular laths in all the angles wherever two pieces of wood joined, thus imparting to the vessel perfect water-tight qualities. To be able to apply a thicker coating of varnish over the glue mixture, I first attached on the inside, by means of varnish, a sheet of thick filter-paper, and afterwards impregnated the latter with the same material, so that I possessed a layer of varnish of the same thickness as the paper. There would appear but little doubt that a coating of this description would preserve the wood from all attacks of moisture, at the same time a like object might possibly be attained by impregnating the wood with gutta-percha, India-rubber, or paraffin. These substances are not more impermeable than varnish, but they would better resist the action of the reagents employed in photography, for cyanide of potassium, as likewise ammonia, readily dissolve the varnish coating.

DECOLORIZING THE PRINTING BATH.

BY A. L. HENDERSON.

THE boiling of a bath of nitrate of silver for printing, with the view of removing the albumen, is a subject on which I should like to offer a few remarks. First of all, let me observe that the method proposed by Mr. England for effecting the decoloration, is by no means so new as that gentleman imagines; I, at least, used to practise it about seven years ago, and it is from the experience I then acquired that I am now about to speak.

Great care must be taken in the selection of a proper vessel in which to boil it. An ordinary glazed pipkin or earthenware pot is usually recommended for purposes of this kind, but, in this special instance, it will not answer above once or twice. These pipkins are made of a porous, absorbent clay, and only so long as the glaze keeps on will it be useful. It is usually the case that, after boiling the nitrate of silver bath once or twice, the glazing gives way and cracks, and the silver thus obtaining access to the porous clay a serious waste is caused.

The best way of coagulating the albumen by boiling, is to place the bath in a bottle inside of a pot of water, taking care, previously, to have a piece of wood placed at the bottom of the pot to prevent contact between the glass and metal, otherwise there is a chance of your glass vessel breaking and the whole contents mixing in the iron pot, of course precipitating the silver. Such an accident once befell me, as I remember to my cost.

I have found, by using some samples of paper, that boiling did *not always discolor* the bath; but on carefully observing it I generally found, when boiling did not discolor the solution, that it was either *alkaline* or acid *in excess*, and, by neutralizing and reboiling, I have seldom failed to decolorize the solution.

But all this is a waste of time and a source of expense. Mix the silver with plain water, and you will find very few samples of paper that will discolor the solution.

About three years ago I came into the room where one of my assistants was engaged in the operation of boiling a bath to precipitate the albumen, and, although the pipkin was perfectly whole, I found that the silver was oozing out. Subsequent reflection upon this led me to abandon this method of decolorizing the printing bath, and determine upon the adoption of a paper which would not cause any discoloration. That which I now use never discolors the bath—a property which, if I understand rightly, it owes to the salting materials employed rather than to any steaming or other analogous process of rendering the albumen insoluble. I think, however, that I may lay it down as a rule that those papers which discolor the bath yield very fine tones—in this respect probably superior to those which do not so discolor it.—*British Journal of Photography.*

MODIFIED INTENSIFYING PROCESS.

WE have been favored by a Danish reader with a very perfect transferred negative, as an example of a modified plan of using the mixture of chloride of gold, ferridcyanide of potassium, and persulphate of uranium, for intensifying. The negative is a reproduction of a page of the *Photographic News,* and is an admirable illustration of the kind of negative required for printing copies of black and white subjects: perfect clearness and absence of deposit in the transparent parts; perfect opacity in the dense parts. We have pleasure in printing our correspondent's letter, both as describing an admirable method of intensifying, and exhibiting a spirit of communication which is very gratifying. He says:

"After developing and intensifying with iron, the plate is fixed with cyanide and thoroughly washed. Then, to a dilute solution of chloride of gold is added a few drops of the ferridcyanide intensifier, with uranium in excess. This is then poured over the plate, and off and on until the desired density is attained. A very dense black precipitate is the result. If too much ferridcyanide is present, the plate gets blue; and if not sufficient, gold red-brown.—I remain with respect, your Danish subscriber,

"JOHN OTTO."

"BERNSTORF BY COPENHAGEN, June 6th, 1869."

Photographic News.

ON THE BURSTING OF COLLODION BOTTLES.

BY R. W. ARTLETT.

FROM time to time serious accidents, arising from the bursting of bottles containing ether, collodion, etc., have been recorded in these columns—these accidents leading in many cases to fires, and in some to personal injury and even death.

As this is the season when such mishaps are most likely to occur, I beg to lay before your readers a few facts with which, as I have never seen attention directed to them, some are, perhaps, unacquainted, and which, if borne in mind, will much diminish the chance of this kind of accident.

Some time back, while taking some photographs in a rather warm room, my attention was aroused by the repeated ejection of the stopper of the collodion bottle. This happened with nearly every one of the plates. A few minutes after coating, away went the stopper with a puff. On replacing it, all was quiet until another plate had been coated, when, in a few minutes, off it went again.

The question immediately occurred to me—why should the stopper be blown out at all? The thermometer was standing many degrees below the boiling-point of ether; so that, if that liquid had been let up into a barometer tube, the force of its vapor would have been insufficient to expel the mercury, which would have stood several inches higher within the tube than without. And again: Why, after having been replaced, was not the stopper again expelled in the course of a few minutes, instead of remaining quietly in its place until another plate had been coated?

A moment's reflection sufficed to answer both of these queries. It is a law in physics, that when a volatile liquid is introduced into an inclosed space, it fills that space with an atmosphere of its own vapor having a tension proper to the temperature; and that if the space be already occupied by another gas, the tension of the vapor is superadded to that of the gas. Thus, when we coat a plate with collodion, the place of the collodion poured, as well as of the dense ether vapor which flows out in considerable quantity at the same time, is taken by atmospheric air. We close the bottle at a time when the pressure inside and that outside are equal; but all the space occupied by the newly-introduced air is void of ether vapor, a supply of which immediately begins to be formed, and this goes on until the density proper to the temperature is reached, when, of course, the addition to the gaseous contents of the bottle produces an increase in the pressure within. If now we raise the stopper for a moment so as to permit the escape of the excess of the gaseous contents of the bottle, but replacing it before there has been any fresh admixture of atmospheric air, we, of course, equalize the pressure within and that without, and they would remain equal as long as the temperature continued the same, were it not for the fact that, when the pressure was relieved by our loosening the stopper, the ether vapor expanded as well as the air, and consequently was no longer of the density proper to the temperature. The ether will, therefore, again give off vapor until it has supplied the deficiency, and is once more covered by vapor of the density proper to the heat. This, of course, again produces a pressure within the bottle; but as it has only required a comparatively small addition of the vapor to rectify matters, the pressure now produced is very much less than it was the first time.

We see from all this that if, when we pour ether out of or into a bottle, we take the precaution to leave the stopper in quite loose for a short time after, until matters within the bottle have been finally adjusted (which will occur almost immediately if the liquid be agitated with the air above it), we need never have any bursting pressure at all until the temperature rises above that of the liquid at the time the bottle was closed; and then, of course, there will be much less than there would have been if we had started with a strong pressure through inattention to the above facts.

In order to determine what degree of risk we incur by carelessness on this point, I have made experiments to ascertain the amount of pressure generated in this way. Having selected a strong bottle of about five ounces capacity, I introduced a pressure gauge, and poured in a small quantity of ether, closing it with a greased stopper to prevent leakage. The thermometer stood at 62° F. The bottle was allowed to stand perfectly still, and the pressure continued to rise for about half an hour, at the end of which time it amounted to six pounds and eight-tenths per square inch.

Having confirmed this result by numerous trials, I have since repeated the experiment at higher temperatures. At 76° a pressure of eight pounds per square inch is easily reached. At 82° a pressure of ten pounds and three-tenths was attained; and at 86° it amounted to about eleven pounds and a half per square inch. Now, these pressures are far beyond what glass bottles of any size, especially if not round, can safely be exposed to; and though, of course, I do not say that in every case these very high pressures are reached, still always, when we pour ether or collodion from or into a bottle, and immediately insert the stopper, there is a more or less near approximation to them.

It should also be recollected, that if a bottle does not burst, but merely forcibly ejects its stopper, it may give rise to a serious accident, if the stopper, in falling, should break either the bottle itself or another containing a dangerous chemical. It should be remembered that it is not necessary to run these risks, as, if the space above the surface of ether in a bottle contained nothing but the vapor of that liquid, there would be no bursting pressure at all until the temperature had risen above the boiling-point, 96°.—*British Journal of Photography.*

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REMOVAL OF NITRATE OF SILVER STAINS FROM COTTON, LINEN, Etc.

A GERMAN, Herr Grimm, recommends a solution of chloride of copper for the removal of stains from colored woven cotton tissues. Herr Grimm's mode of operating is to moisten the spot or stain to be removed with the solution of chloride of copper (prepared by dissolving oxide of copper in hydrochloric acid). The stain is thereby converted into a chloride of silver, and when the spot is subsequently treated with hyposulphite of soda the whole dissolves, leaving the tissue unaffected. When the tissue is uncolored, and either cotton or linen, the stains may be better removed by first moistening the spot with a dilute solution of permanganate of potash to which some hydrochloric acid has been added, and when this has remained in contact for some little time the tissue is washed and treated with hyposulphite of soda. According to Herr Grimm, the employment of either of these modes of treating stains produced by nitrate of silver does away completely with the necessity of using cyanide of potassium for either of these purposes.

We may remind our junior readers that quite as good a plan as either of the above, and one nearly as generally applicable to the removal of these troublesome stains, is to treat the marks with a solution of iodine in iodide of potassium; the silver stain is thereby converted into iodide of silver, and this is now readily removed from the tissue by soaking in hyposulphite of soda solution. The hyposulphite does not remove the stain as rapidly as the cyanide does; but when given a little time, and with the previous iodine treatment, it is quite as effectual as the more dangerous though more energetic cyanide.—*Chemical News.*

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ON THE PRESERVATION OF NEGATIVES DESTINED TO BE MUCH PRINTED FROM.

BY M. CLEMENT SANS.

(Read before the French Photographic Society.)

LANDSCAPE photographers who work the wet process are well aware that negatives, notwithstanding a coating of good protective varnish, often become unserviceable through the formation of minute spots after a certain period of continued employment; even when the varnish used is of such a quality that the occurrence of accidents to the film need not be feared, the exposure of the same to dust is inevitable; and small stereoscopic views from which large numbers of copies are required, once injured, yield nothing but prints covered with innumerable white spots. To restore negatives of this kind to their former state, it is necessary to remove the varnish, to wash them, and then again to varnish them. But for these operations the collodion film is not sufficiently strong; it becomes detached from the glass, and in this manner very precious negatives are sometimes destroyed, which it is impossible to replace.

For several years I have made a practice of subjecting my negatives to an operation which has had the effect of preserving them in good condition; thus I have some ten years old, from which several hundreds of prints have been taken, and all of them possessed of the same degree of clearness and beauty. In no work on photography have I seen the operation described, and my experience may therefore be of some practical value.

My manner of working is as follows: The negative, finished and well washed (no trace of hyposulphite being allowed to remain in the film), is coated with the under-mentioned solution:

Water,	80 cub. cents.
White of egg,	80 "

Well shaken, and, when subsided, filtered.

The negative is allowed to dry spontaneously. Attention must be paid to the proportions of water and albumen employed, for if the latter is in excess, the film of collodion, when dry, has a tendency to peel off, especially if the same has been much worked during development.

The albumen having dried, the negative is plunged into a 15 per cent. solution of silver, the silver bath used for sensitizing being employed for the purpose, if necessary. The plate remains in the silver solution for a period of thirty or forty seconds—sufficiently long, indeed, to coagulate the albumen—and is then removed and passed into a bath of concentrated hyposulphite of soda. It is then again washed, dried and varnished at a gentle heat with a solution of—

Benzoin,	5 grammes.
Alcohol, rectified,	100 "

When this coating of varnish has become worn out, it is removed by immersion in a bath of alcohol of the same strength as above, the negative washed, if necessary, and again varnished; it is thus again restored to its pristine beauty.

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(Written for Photographic Mosaics.)

A FEW FACTS.

BY CHARLES WAGER HULL.

THERE are many of the little every-day items in a photographer's experience, which he knows well are quite essential to success, but which, for unaccountable reasons, he never fully impresses on his memory. Some of the more important the writer now proposes to submit to the consideration of his readers, and to follow such from the beginning to the end of the negative-making part of the operation.

GLASS.

This should be flat, free of scratches and bubbles. If not flat, always use the hollow side for the film, inasmuch as the spring in the plate-shield will make the plate nearer flat, and not make it worse, as would be the case if placed hollow or concave side next to the springs.

If scratches or bubbles are upon the glass, coat that side; the shadow then thrown by such will be less than if upon the back of the glass. Never use rusty glass; from such the film, as it dries, often peels. No part of the whole operation is more important than cleaning the glass.

COLLODION.

It is quite impossible to give any general rule as to this; each light having some peculiar characteristics, demands, in some way or another, a modification. As an almost general rule, equal parts of ether and alcohol, 95°, with 5 to 7 grains of cotton or 3 to 4 of Liesegang's papyroxyline, excited with about 5 grains of iodide of ammonium and 2½ grains either bromide of potassium or cadmium. If contrasts are too heavy, and alone owing to the collodion, add of collodion, in which both iodide and bromide of cadmium alone have been used; this usually softens, and adds very much to the roundness of the negative.

DEVELOPER.

This should be weak, and have added enough acid to make it flow evenly. A strong developer is likely to force up the high lights to such opacity as to destroy the negative before the details are well out. For children and *quick* out-door work a strong developer must be used, even at the loss of half-tone. In developing, hold the plate absolutely still; by doing so, the detail is better obtained and strong high lights avoided.

FIXING.

Wash well before fixing, or stains are certain to result; wash well afterwards, or the varnish will crack and split away from the film. Never allow hypo to drain from the corners of the plate upon the floor of your dark-room, else, when it dries, it will rise up in fine dust and destroy every negative you make; pinholes by the thousand will be seen upon every plate the dust touches before development. Cyanide is as bad in that respect, and worse in respect to health, if passed into the lungs; it should never be used except in the field, and only then when water is difficult to obtain.

LENSES AND CAMERAS.*

No matter how good your chemicals, you will fail if your tools are poor; the camera must be light-tight, and work evenly and truly.

Lenses are all-important; they must have depth, field, and even illumination; they must be made of glass as nearly white as possible. If it is greenish or brownish, the image will appear well on the ground-glass, but, upon the chemicals, will be slow working, and always deficient in its rendering of details in deep shadows.

Many lenses have both visual and chemical focuses; this is easily discovered by the use of Mason's ingenious focimeter, a description of which was published in the *Philadelphia Photographer* last year or year before.

POSING.

This all-important part of the photographer's duties, is understood by but few of the many who follow the business, but must be acquired by all who expect long to remain, and who aim to be among the first-class. This covers the lighting of the sitter, as well as his position upon the chair, and, in itself, is quite enough for a lengthy article. I shall only throw out a few general hints and name a few general rules.

Place the object, at which you direct the sitter's eyes, some distance away, or the effect, if too near, will be a squint.

If the side-light is too strong it will also produce the same trouble.

Too strong a light upon the eye will also produce the effect of a stare.

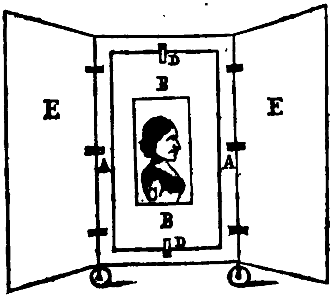
Too strong top-light will render the shadows under the eyes, nose, and chin too heavy; to avoid which, shade off by tissue-paper, or, otherwise, the top-light directly overhead. Persons with strongly-marked features should not be placed in a very strong light: it gives too much rigor and contrast; sit such in softer and more diffused light; those with round, full faces under good strong top-light; to such you are then able to give force and character of expression.

For a blonde, use a somewhat dark background; for a brunette, a lighter background: you will thus be able to give roundness and needed contrast.

Backgrounds may be made of any shade by moving to or from the light; thus, if you desire such light in color, place it so that the full force of the light will strike it broadly and evenly; to darken, turn one end away, allowing the light to fall aslant; the more you move the one end away the darker it will become.

If you desire to make the now justly celebrated "Rembrandt Effects," do not use, as has been recommended by some writers, a black background; use the same that you use for any other work. Do not use a looking-glass for a reflector; have the shadow-side fully illuminated with a soft, well-diffused light. "Rembrandt Effect," is simply producing a photograph with shadow-side next to the camera; it adds exceedingly to the roundness and softness of the picture, and, if well made, does not give any of that very disagreeable and unnatural broad light over the face, by which it is rendered flat and chalky.

The reflector and counter reflector, invented by Mr. William Kurtz, of New York, as seen in the annexed drawing, is a capital aid to securing "Rembrandts." A frame, A, upon rollers, has within it a frame, B, held by the buttons at D; through the hole at C is seen the head and bust of the sitter. It is self-evident, that if the wings, E, E, are moved towards the sitter, a strong, reflected light can be thrown upon him, and any desired effect,



by skilful use, can be produced. These wings are hinged to the frame, A, as shown. The camera looks through the hole at the sitter. If more than a bust picture is wanted, then remove the inner frame, B. The side next to the sitter is lined with white paper; tin foil has been tried, but does not suit as well. Wings at the top and bottom have also been experimented with, but without any very good results. The size of this reflector is about seven feet square over all.

Some photographers pay too much attention to the dress of their customers, forgetting they have a face; this far too common habit must be changed by those who would make a reputation with the general public.

In the now fashionable large head on the card-size, always draw the focus *well forward;* if not, the back hair will be too sharp, the whole effect inartistic, the picture lacking roundness; also, for the reason that, if too far back, the features will be out of proportion, the nose, mouth, and chin will be distorted and enlarged, thus, the drawing will be faulty.

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(Written for Photographic Mosaics.)

TO WORK AND KEEP A NITRATE BATH NEUTRAL.

BY WILLIAM BELL.

FIRST make the following solution: Nitrate of silver, four ounces; water (distilled), forty ounces; iodide of potassium, six to ten grains. Mix, set in the sun to blacken twenty-four hours; filter, and add twenty grains of cyanide of silver; set again in sun twenty-four hours, shaking occasionally. Test for acid with blue litmus paper. If there is no acid present, filter and use. Should it still be acid, add more cyanide of silver, shaking well, and keep it in the sun until neutral. After the bath has been in use for some time, it becomes acid from the collodion, and is less sensitive. Take it out of the bath-holder, boil for an hour, then add sufficient water to make the solution milky; set it in the sun twenty-four hours, filter, and add nitrate of silver to bring it up to its original strength. Now add the cyanide of silver (sun and shake as before), being sure to add enough to neutralize all the acid present, which it will do better than any other alkali, as it leaves no fogging effect, necessitating the use of acid to make it (the bath) work clear. The advantages of the above bath are shorter exposures, less harsh high lights, softer shadows, better draperies than when an acid bath is used,—advantages not to be despised.

To make *cyanide of silver*, take of

Water,	4 ounces.
Cyanide of potassium,	2 "

Dissolve, and to the cyanide solution add a strong solution of nitrate of silver until no more precipitate forms. Thus you have the silver in excess. Throw the precipitate into a filter, wash well by percolation, dry, pulverize, and bottle for use.

Alcohol contains more or less organic matter, and that is often the cause of fogging when a neutral bath is used. Rectify the alcohol as follows, with stock silver solution, No. 1:

Finely pulverized nitrate of silver,	50 grains.
Distilled water,	60 drops.
Alcohol,	4 ounces.

Shake well, filter, and use. Now, to every thirty-two ounces of alcohol add fifteen drops of silver solution, No. 1, sun the alcohol for twenty-four hours, filter, and use for making collodion.

The following salted or iodized collodion is being used with this bath with fine results:

Ether,	5 ounces.
(Silvered and sunned) alcohol,	5 "
Bromide of zinc,	15 grains.
Iodide of cadmium,	15 "
Iodide of ammonium,	30 "
Papyroxyline (Liesegang's),	50 to 80 "

The object of the above bath and collodion being to purify both from all trace of organic matter, which, when present in either, requires the use of acid to overcome, thereby entailing insensitiveness. See that your dark-room, box, and plate-holders are light-tight, or light-proof.

MARBLE MARKINGS ON THE NEGATIVE.

BY L. G. KLEFFEL.

THERE are but few photographers who have not remarked the appearance of this phenomenon upon their plates, and have yet been unable to explain its origin. The markings to which we refer are generally of a mottled or flowery nature, and appear upon the plate after sensitizing; the lower portion of the film is more particularly attacked, although the centre is also sometimes marked, the defect being best seen by transparence before development, or, if this latter operation has been somewhat vigorous, the stains are likewise apparent by reflection at the back of the plate, when they appear to be situated between the glass and the film.

With very porous collodion—such as is employed in the preparation of dry plates—this phenomenon is never, or very rarely, produced; with other collodions it often occurs; that is to say, if the operations are not conducted in a careful and uniform manner.

A long series of researches and experiments, instituted with great care, has proved to me conclusively that these stains are due neither to the collodion, nor to the silver bath, nor even to defective cleaning of the plates; the sole cause of their origin lies in want of care and attention on the part of the operator in sensitizing the plate. This is abundantly proved by the fact that it is possible to produce and avoid the phenomenon at will.

I have been enabled to arrive at the true cause of the irregularity, and a knowledge of the same will at once suggest the remedy. When a plate is coated with collodion, there is formed at the spot where the liquid is allowed to run off, a thicker accumulation than upon the opposite portion of the plate, and at this point, therefore, the collodion takes a longer time to set. If the plate is plunged into the bath in the position in which it has been coated, a lateral ebbing of the liquid is brought about, and this, on flowing back after the complete immersion of the plate, produces a wavy motion, causing the film to rise at that point where it is still moist and but imperfectly adherent to the glass. This action naturally follows in a direction from the edge towards the centre of the plate. The raised portions of the film, being where the collodion is thickest, are more strongly iodized than those portions where the coating is thinner, and it is this inequality in the amount of the iodide which gives rise to the mottled and flowery markings under discussion.

The defect is, indeed, very strongly pronounced if the plates are rapidly and abruptly plunged into the bath before being perfectly set, as the more agitated the solution the more decided is its action upon the film. On the other hand, if care is exercised in properly drying the plates and in immersing them slowly and regularly, the phenomenon disappears altogether. Agitation of the bath while the plate is immersed fails to arrest the formation of the stains, as these are irremediably formed at the moment of the plate entering the liquid.

In order to control the correctness of my observations, I instituted an experiment in another direction, the result of which leaves no doubt as to their accuracy.

If the collodionized plate is reversed in such a manner that the more thickly coated portion is uppermost, the marble markings become of less frequent occurrence (if the plate is immersed too soon and too rapidly), because the part exposed to the action of the wave is less thick and more perfectly set, and the lifting of the film is therefore less pronounced. Another conclusive proof is afforded by the fact that if a plate is held in a diagonal manner to drain, the markings are formed in the same direction and of corresponding intensity, according as the collodion on that spot is thicker and less perfectly set. If a plate is divided into two portions by means of a waxed thread, and one-half thereof coated before the other, so that the first portion is set before the last, and if the plate is then immersed parallel with the thread, the half first coated will be found to be quite clear, while the other is very far from being so.

For the above reasons it is evident that the phenomenon cannot be produced if horizontal baths are employed, where the liquid washes the plate uniformly, affecting alike the whole surface of the film; a rising of the latter is, indeed, impossible, on account of the liquid pressing down upon the surface of the plate.

A collodion containing more ether than alcohol is less subject to the defect, on account of its setting more quickly, and adhering rapidly to the plate: at the same time I would not recommend the exclusive use of a collodion of this description, from the fact that it is always inferior in quality to that which contains an excess of alcohol, and because, as already pointed out, the stains or markings can always be avoided by careful manipulation.—*Bulletin Belge de la Photographie.*

REMARKS UPON REMOVING VARNISH AND RETOUCHING NEGATIVES.

BY F. STOBZE.

It is not unfrequently the case that it becomes expedient to remove the varnish from a finished negative; either the image is too soft, or too vigorous, or the varnish has absorbed a certain amount of silver. In all these cases the method generally adopted is to remove the varnish by means of alcohol; this is, however, a time-taking operation, and, moreover, a very uncertain one, for the majority of varnishes (whose principal ingredient is bleached shellac) withstand even absolute alcohol to a greater or less extent, so that it is never practicable to strengthen or weaken the negative subsequently. For this reason I have discarded the employment of pure alcohol, and have adopted, instead, the following mode of procedure:

A solution is prepared of one part caustic potash in ten parts of water, and to this is added ten parts of alcohol. This liquid may be kept ready for use. A little of it is put into a glass, and poured on and off the negative until the varnish ceases to flow, in a rippling stream. It is sometimes necessary to employ a fresh supply of the solution, when every trace of the varnish will be removed. The plate is subsequently placed under a tap, and washed until the water runs smoothly off; it is then finished, and may be dried.

It will occasionally happen that, during the removal of the varnish, a gritty deposit is formed. The surface of the plate may be cleansed of this by passing lightly over the film a large camel's-hair brush, during the operation of washing. If the manipulations are carefully conducted, no fears need be entertained for the safety of the plate; although if the latter has received a coating of gum, albumen, or gelatine, previously to its being varnished, a greater guarantee is thereby afforded.

If the varnish is removed simply by reason of its having absorbed silver, there remains nothing to be done after the plate has become dry, but to re-varnish it. If, however, the negative is to be intensified, or rendered less dense, I proceed in the following manner: To bring about a reduction in the opacity of the film, I pour over the plate, previously to its being washed, a pretty strong solution of cyanide of potassium, to which an equal volume of alcohol has been added; and as soon as the film has become sufficiently transparent, wash it at once. A similar method is adopted for intensifying. For this purpose I generally employ Selle's uranium intensifier, to which I add a like volume of alcohol. If, however, pyrogallic acid and silver is to be used for intensifying, I wash the negative first, and then apply the liquids in the ordinary manner without any addition of alcohol.

In removing the varnish from negatives, all retouching upon the film is, of course, washed off; without, indeed, the plate has, previously to its being varnished, been coated with a thin layer of some cementing material, upon which the retouching has taken place. As a suitable material for this purpose, I would recommend either one part of gelatine, dissolved in twenty parts of water, or ten parts of albumen, ten parts of water, and one part of caustic ammonia.

The compound last-mentioned is particularly well adapted to the purpose, for the most delicate pencil-retouching is possible on a negative coated with it. This preparation is also suitable for manipulation with a brush, and possesses the great advantage that after varnishing the retouching does not appear darker than before. At the same time, I should remark, for the information of those who have but little experience in the matter, that all plates which it is desired to coat with gelatine or albumen before being varnished, should be kept somewhat soft and transparent, as, on the drying of the two preservative coatings, the plate gains in vigor.

This mode of proceeding I can confidently recommend to all those who print many copies from their plates. The retouching is shielded from injury by the varnish, and if the latter is of good quality, the plate may be even washed with safety. If, again, as in winter often happens, the varnish absorbs silver, the plate may be unvarnished without risk of injuring the retouching, which has cost so much trouble to apply.—*Licht.*

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A STRONG developer for an under-exposed negative, and a WEAK one for a fully-exposed negative.

ON THE RECOVERY OF GOLD FROM THE TONING BATH.

BY F. W. HART.

AT a late meeting of the South London Photographic Society, the following subject was drawn from the "question box:" "What is the best method for recovering the gold from the toning bath?" Mr. Hart was requested to open the discussion on the subject, which he did in the following remarks:

In reply to the question from the box?—"What is the best method for recovering the gold from old toning baths?"—I have to state that I generally proceed by first rendering the inert solutions of gold acid with sulphuric acid or hydrochloric acid; then I add a hot saturated solution of sulphate of iron, till the solution ceases to be rendered cloudy by any further addition. I then let it stand in a warm place for subsidence before pouring off the clear waste solution, and add a few drops of iron solution to make sure that the gold has been completely deposited. This having been ascertained, I drain off as closely as possible, and wash with three or four changes of acidulated water, and finally with plain water. The precipitate will now consist of metallic gold and chloride of silver.

In order to get the gold in a separate state, I prefer to reduce the chloride and bring the metals into a button, and add about three times its weight of silver. I then pour it out into a pan of water, and collect and dissolve in nitric acid. The gold will be left as a dark brown powder. After decanting the nitrate of silver solution, it is repeatedly washed with distilled water till the washing gives no indication of silver on testing with a chloride. I now drain off the water closely and dry at a gentle heat, finally bringing the powder to a low, red heat, when the powder will take a rich golden hue.

If the mixed precipitates of gold and chloride of silver are not reduced and melted, but treated at once with hot hydrochloric acid, to which nitric acid is added at different times till effervescence ceases, then the solution must be largely diluted with water, in order to counteract the property that hydrochloric acid and concentrated chlorides have of holding chloride of silver in solution; then, to get at the amount of gold, it must be reprecipitated.

IN-DOOR AND OUT-DOOR HINTS.

BY NITRIC ACID.

A CERTAIN and ready way of taking a collodion positive film from the glass, on paper, may be accomplished with the aid of a solution of shellac—in naphtha and some common lampblack. Dissolve the shellac in the naphtha to about the consistence of varnish. This will make an article known to house painters as "Patent Knotting." Mix some of this with a small quantity of lampblack, and apply the same with a soft brush to the collodion film. When dry, coat a piece of thin paper with the same preparation, and lay it also on to the blackened collodion film, pressing or rolling it well and firmly down with a rounded stick or ruler. When about three parts dry cut to the shape with a sharp penknife, lift up a corner, and with a camel-hair brush introduce between the glass and film a few drops of water; continue the lifting gently, and by degrees, when the film will peel away from the glass clear, clean, and unbroken; gum or paste down on cardboard; put in a press or under a weight, and allow to dry. These films, when so prepared and taken off, can be colored in oil or powder, varnished, mounted on cards, or inserted in trays or cases, with or without glass; look remarkably well; can be sent by post, and are, as far as fair *and reasonable wear and tear goes, indestructible.*

The Pruning Knife and Photo Lasso.—In going out to take views, a large pruning knife, a quantity of strong string, and a pointed pole will be found invaluable; views and picturesque bits, church windows, etc., are often marred and spoilt by some small unsightly branch or twig that will get in the way. By throwing a line over the same lasso fashion, pulling down, and fastening back, or if necessary, chopping off with the strong pruning knife fastened to the end of the pole, you will make short work of a troublesome intruder, and in many cases add materially to the value and beauty of the view.—*The Illustrated Photographer.*

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THINK while you work, and practice what you know.

THE DEVELOPER.

BY E. DUNMORE.

WHEN our negatives bloom out gradually and evenly, until every detail is apparent in the shadows, and the highest lights are sufficiently opaque, we congratulate ourselves upon having hit the right and most desirable formula. The proportion of each chemical bears a proper relation to its fellow, and the process throughout works harmoniously and pleasantly. The developer that will give the greatest range of tone, other things being equal, is the developer *par excellence.* Range of tone depends in a great measure on the *fineness* of the deposited silver that composes the image, and is somewhat independent of strong or weak solutions. We all know the former produces softer and the latter pictures with greater contrast; still, neither of them will produce perfect results unless the deposited metal be in a state of the most minute division,—the finer the better. The color of the negative depends entirely on the quality of the deposited silver. The finer the deposit the more non-actinic the color; therefore, possessing the power of producing greater range of tone, if the deposit be coarse there is always a loss of detail in the shadows of the prints, the more attenuated layers not possessing sufficient force to obstruct a proportional amount of light. However they may appear on the negative, this is the reason why frequently a negative will not produce such good prints as might be expected from its faultless appearance.

I may here remark that the use of an acid sample of sulphate of iron invariably tends to produce a coarse deposit, and will never produce so great a range of tone as a non-acid sample. This kind of sulphate—the acid kind—is readily distinguished by efflorescing instead of oxidizing on exposure to air and moisture.

I formerly used to advocate the employment of a great variety of developers, but have of late considerably modified my ideas on this matter. One strength of developer for summer and another for winter is nearly all that is required in general use for landscapes, portraits, or reproductions. Of course, occasions will arise when a special developer may be an advantage,—then by all means adopt it; but, in a general way, one kind is all that is necessary for the copy of an engraving or a delicately-modelled portrait. I believe the difference in the subject to be copied may be equalized for development by difference in exposure.

Economy is an excellent thing, but a mistake if applied to the sparing use of the developer,—especially in large work, which, of all kinds, requires a steady, copious, unhesitating application. Never mind a little waste; a great advantage will compensate for it; and, rest assured, there will be plenty of silver left to make the image. All that is required is a proportional and even deposit, which is certain, if the plate have received the right exposure, of making a good negative. Mark the difficulty of copying a pencil sketch on white or gray paper—to cover the whole of a large plate to the edges, keeping an equal intensity throughout—if the economical method of development be adopted. But use it with a lavish hand; see that the whole plate is covered with one unbroken flow of developer—never mind the silver washing off—and you will succeed in obtaining an evenly and accurately-developed negative. The same rule applies to a picture full of lights and shadows; but in this case uneven development is not so observable on account of the subject preventing an easy comparison of its different parts; whereas, in the first instance, any difference is very conspicuous. Once obtain an evenly-developed negative, and the intensity is readily managed. On the other hand, begin with an irregular deposit, and the after-intensifying is rarely satisfactory.—*Read before the N. L. P. A.*

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ON THE PRESERVATION OF NEGATIVES.

BY WILLIAM ENGLAND.

ANY suggestion bearing on this subject will, I am sure, be welcomed by any unhappy sufferer who, like myself, is destined to make the disagreeable discovery, from time to time, that "a thing of beauty" is not always "a joy forever," particularly when one takes hold of a valuable negative which has been stored away for some time, and discovers the fact that its beauty is destroyed beyond redemption. I presume most photographers have met with these misfortunes, and will readily understand the nature of the injuries alluded to. I refer to the splitting of the film, and formation of minute cracks all over the picture, or the film itself rising into ridges. This last, by the way, I have seldom seen with my own negatives, but some photographers experience this form of disease only; others, like myself, are more afflicted with the former, whilst some few operators claim exemption from all kinds of disorder. As I do not happen to belong to the last-named fortunate class, cases of necessity have compelled me to endeavor to find out the cause, or discover a preventive, of the evils before mentioned. No doubt one, and perhaps the primary, cause of the deterioration of negatives is insufficient washing; yet when every possible care has been taken, we cannot be quite sure that our negatives are safe.

I think the suggestion made by Mr. Spiller, a short time since,* to store the negatives, or the boxes containing them, in a sort of Norwegian cooking apparatus, or receptacle lined with felt or other non-conducting medium, is likely to be a valuable idea. This plan, would, no doubt, be a protection against sudden changes of temperature, and, to some extent, also against moisture. I have made many experiments with the view of finding a perfect protection for the negative; but no plan has proved quite reliable. I feel convinced that the varnish alone cannot always be depended upon; for I have tried many samples, and in no case have the negatives been entirely preserved from injury, though some have become spoilt sooner than others. I think if we could cover the negatives with a substance calculated to hermetically seal up the film, so to speak, when out of use, a step would be gained; and with this view I have been led to try the coating of the film with white wax. This can be very conveniently effected in the following way: Dissolve virgin wax in oil of turpentine to about the consistence of thick cream. Apply this composition with a plug of cotton-wool to the varnished negative before putting it away in the plate-box. When again required for use, slightly warm the negative, and rub the surface with a piece of clean cotton-wool. The wax is easily removed, and the surface presents a nicely polished appearance, and, at the same time, any dirt that may have been adhering to the negative is removed with the wax. Plates protected in this way I have purposely subjected to very rough treatment, such as extremes of temperature, moisture, and exposure to strong acid fumes, without the slightest injury resulting. I feel very sanguine that by waxing the negatives before storing them away an efficient protection will be afforded. As a final remark, I may say that I have never known a negative to become spoilt by the splitting of the film so long as it remained in the pressure-frame and was constantly printed from. On this point I can speak decisively, as some of my negatives have been in constant use for many years, and not a single instance of injury of the above description has occurred. This seems to prove conclusively that it is only necessary to protect the negatives from atmospheric influences when not in use.—*The Photographic Journal.*

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* Year-Book of Photography, 1869, page 87.

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(Written for Photographic Mosaics.)

NOTES ON PHOTOGRAPHING SMALL OBJECTS FOR THE STEREOSCOPE.

BY O. G. MASON.

EACH year, since the invention of the Stereoscope by Sir David Brewster, has marked some advance in its introduction, not only for amusement and recreation, but for the higher and nobler objects of education and enlightenment, until it has become a necessary adjunct to the telescope and the microscope; showing us the true form and configuration of the distant world which we examine with the first, and the wonderful symmetry of the myriads of organisms, of which, without the aid of the latter, we should have but a faint conception.

The name of Brewster has a choice corner in the memory of thousands, who neither know of, nor care much for his other and, to many, greater discoveries. He who gave us a little instrument, now within the reach of all, so simple that a child may use it successfully, yet so efficient that it noiselessly and instantaneously transports us to distant cities and other climes, and preserves for us the beautiful forms of long past years, both animate and inanimate, is certainly worthy of being remembered. Beside the pleasure which we gain through the "wonderful wooden-mounted spectacles," there comes positive knowledge, demonstrations of facts, which we could gain in *no* other way. The relation, size, and location of various objects, the different parts of the same object, and the true connection of one with the other, are often matters of question, until their fixed images are examined in the stereoscope.

During the last few years the photographer has been liberally patronized for stereoscopic work; yet there is one class of stereoscopic pictures very seldom seen in market, a class which would, if well made, meet with ready sale, and add materially to the income of the producer, viz., stereographs of small objects, say from one-eighth to six inches in size, hundreds of beautiful specimens for which may be found scattered through the vegetable and animal kingdoms, and are produced on every hand through the agency of the various arts and sciences. We occasionally see stereographs of bouquets, baskets of flowers, or floral wreaths and crosses; and as the list ends about there, some may suppose that the proper material has been exhausted.

How many have seen stereographs of butterflies in their wonderful variety, dragon-flies, bees, beetles, and the almost countless objects of insect life, enough of which our own country furnishes to employ the photographers of the world? Or who has yet seen the crystalline realm in the stereoscope? It is not necessary to reduce huge cubes of ice to three by three inches, in order to show the beautiful work of the crystal builders.

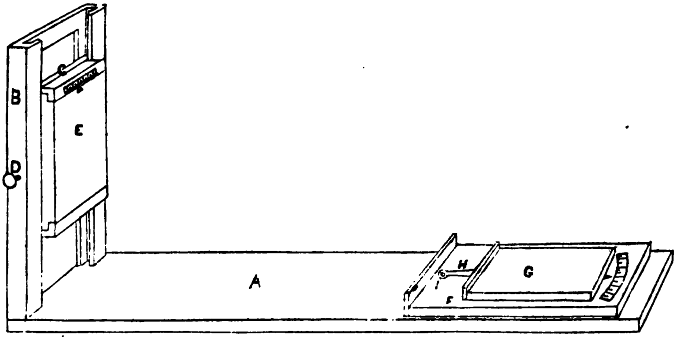
By proper arrangements, small, delicate material may be used, and the stereograph made to full scale of the original, or with but little reduction, and in many cases may be much enlarged, showing beauties not visible to the unaided eye.

A few dollars will furnish the established photographer with the extra pieces of apparatus necessary for adding greatly to his stock in trade, and the acquisition of much valuable personal knowledge, provided he is a careful observer, which *all good* photographers are.

First, he must discard in this small work the ordinary or double stereoscopic camera, and substitute in its place a single camera, so that he will in a measure work somewhat in the style of those who many years ago made the first pictures (daguerreotypes) for such a purpose.

Second, he should provide himself with a table or equivalent apparatus, which will admit of a free motion of the object at right angles with the axis of the lens, and having a provision for swinging the back end of the camera along a graduated scale upon the segment of a circle, the centre of which is at all times *directly under* the lens. The lens should be of rather long focus, as such lenses have greater penetration or depth for such work; in many cases the one-half and four-four, or whole size portrait combination, give excellent results.

The principal parts of the apparatus are essentially like that described and figured in the January, 1869, issue of the *Philadelphia Photographer;* but for stereoscopic work may be of such simple construction as may be well made by any ordinary carpenter, at a cost of two or three dollars. The form and method of working the apparatus will be readily understood by the following diagram and description.



A is a straight board about six feet long, upon one end of which are rigidly fixed the two uprights B, at a true right angle, and so rebated or grooved as to admit of the board C being raised or lowered, and held in place by the set-screw D.

Upon this board C are fastened two guides, in which the plain board E has a free lateral motion, the amount of which, to the right or left of the centre, is shown by a small scale, marked on one of the guides, as seen in the diagram. Upon this board E the object to be photographed is fastened, or it may be laid upon a small shelf, attached to the board at pleasure, and, as will be seen, the object may thus be moved either up or down, to the right or the left, by the motions described.

F is a board which has a free motion along the surface of A, so that it may be run toward or from the object. Upon this board is laid the board G, which serves as the bed or support of the camera. G is attached to F only by the loose pin H through the tongue I.

This pin should be directly under the lens, when the camera is in position, and if lenses projecting to various distances from the front of the camera are used, a series of holes are made in the tongue I into the board F, so that the pin may *invariably be under the lens.* On the other end of G a point or mark is made, in such a position that a line drawn from it through the pin H would fall exactly below the centre of the scale on the guide of the board E; this point or mark serves as an index, showing the position of the camera and the degree of movement to the right or left on the simple scale drawn on F, as shown.

With an apparatus so constructed we may proceed to work in the following order: First, see that the index-marks or points on the boards E and G are at the centre or zero of their respective scales. We then place our object on the centre of E, and our camera on G, and proceed to focus the image, the size being regulated by the movements of F, carrying G and the camera nearer or further from the object. After obtaining a satisfactory size and focus of image on the ground glass, we slide the board E to the right, according to the size and nature of the object, the amount of motion seldom exceeding one inch, and often not one-fourth of that distance. Now, by looking at the ground glass of the camera, we find that the image does not occupy the centre or proper position, but may be made to do so by moving the back end of the board G to the left, the pin H being the centre around which it swings.

When the image again occupies the proper position on the ground glass, the reading of the two scales should be noted, and a negative made. Then by moving the object-board E an equal distance to the left, and swinging G with the camera back across the centre of the scale to a corresponding point on the right, the image will be found to occupy the proper position, and makes no further focussing for the second negative.

By cutting to size and mounting the two negatives on glass, as is usual before printing, we produce that which, from the nature of the case, would be impossible with the ordinary stereoscopic camera.

A single trial will be sufficient to convince any one of the ease with which such work may be done. The apparatus is very efficient in ordinary work for copying small pictures by removing the board G, and placing the camera on F.

OUT-DOOR WORK—HINTS FOR BEGINNERS.

BY J. C. L.

IT is of the utmost importance to make sure, at home, of the perfect working of the apparatus and chemicals. We have frequently met photographers out of doors, looking tired, vexed, and worried, because, on arriving at the scene of their labors, an obstinate bath would not work, or the plates were found too large for the slide. A little care would have saved all this vexation, and it is vexatious, indeed, to find that, after a long journey, the day's work is spoiled through some slight defect which might have been remedied in a few minutes before starting.

The camera should be well looked to first of all, for it will often happen that, during the winter it may have become warped or split, so that the slide will not fall easily into its place, or that a stray ray or two of light will get into it. We have found it a good plan to carefully line the inside of an out-door camera with black velvet at the commencement of the season, so as to exclude any light which might otherwise find its way to the plate through, say, a screw-hole, and also to prevent reflection from the sides of the box.

It is a good plan to take the camera out into the brightest sunlight, and expose a plate as long as possible as a test, not removing the cap from the lens. Should the plate fog under this test, look out well for a stray hole in the camera, which is probably the source of the defect.

We need not here enter into details as to the tests for the chemicals, as they are too well known to need recapitulation; but we may observe that they should be in the most perfect condition. When one is at home, with all the resources of the laboratory at hand, a defect can readily be remedied, but, out in the country, the case is different: if we fail then we fail for the day, and the time is lost. Beside this, to really succeed with a landscape is a difficult matter, and, if the best results be required, nothing should be neglected or overlooked. Every precaution having been taken, we may, in fancy, travel to the chosen spot, in wood, or lane, or field, and proceed to work.

Before deciding where to erect the tent, it is well to spend a few minutes in a tolerably careful examination of the spot. It often happens that there will be a score of pictures within five minutes' walk of a place where the tent may be fixed, and it is better to make it as nearly central as may be, to save moving it about.

When possible, set it up on a slight slope, the highest part of which should be in front of the tent; the water used will then run away from the feet of the operator. If this be not done, very few washings will convert the ground into a puddle, dirty and unpleasant to stand in.

When all is ready set up, camera, bath, developer, plates, and all set handy, take a damp cloth or sponge and carefully dust the inside of the tent and camera, clean the lenses, and allow all to settle for a few minutes before coating a plate.

During this time, a good point of view may be selected, from which to take the first picture. This operation cannot be too carefully performed, for upon this hinges the success or failure of the work. It is no use to photograph a poorly-selected view well, for it will only be, at the best, a good photograph, quite a different thing from a good *picture*, a fact, we fear, which is frequently lost sight of by many photographers. It will be found that a difference of a few inches in the point of sight will often make a vast improvement, and too much care cannot be exercised. The resulting picture will show whether the photographer is only an operator, or really an artist.

If the temperature is very high, it is a good plan to carry a couple of pieces of white calico, one for the tent and one for the camera. If these be damped with cold water, and placed over them it will be found much cooler in the tent, and the plate will keep longer in the camera. In forest scenery a very long exposure is often required, especially if the most picturesque effects are desired. The most lovely bits are generally to be found in dark, out-of-the-way corners. It is difficult to secure these, it is true, but it is certainly not worth while to take a bad view because it is easily done. A bit of good, solid, dark foreground subject often makes a picture, but it is difficult to secure detail in this without danger of losing some of the effect in the distance. A highly bromized collodion, not too thick, and giving much detail, without intensity, will be found best for this. Be very careful as to intensifying. Many forest scenes are utterly spoiled by over-intensity of the negative. When the full detail is obtained, carefully examine the effect, and only intensify when it is absolutely required for artistic effect.

If possible, coat your plates in the open air instead of in the tent; you will find the comfort of this in the course of a long day's work. In fact, the fixing and final washing may all be done outside, and fresh air will be found more conducive to good work than the heated atmosphere of the tent, which often knocks up one who is unused to it in a few hours. Open the tent and let the air blow through it after every plate, and it will keep fresh all day.

We will conclude these few hints by remarking that it is important, while working out of doors, not to hurry any of the operations. Those used to studio work will find a tent awkward to work in, and it is only by care and steady working that this difficulty can be overcome. When a few plates have been worked, the tent will be as handy as the well-appointed dark-room at home, but, if once the operator gets "flurried," there is an end of successful work for the day.

Above all things, it is important to rest satisfied with nothing short of the most perfect results. Examine the view to be taken well before operating; then, when the negative is made, see that it represents the beauties of the scene as nearly as may be in every detail; and, if it does not, go to work and take another; and if you only obtain one good picture in the day, you will be better paid in the end than if you had made six inferior ones.—*The Illustrated Photographer.*

ON EXPOSURE.

BY E. DUNMORE.

THE time of exposure is of the utmost importance,—more so than many feel inclined to admit who leave the development to remedy any little mistake in this respect. When a properly-timed negative is developed, it is very difficult to injure it by keeping the solution on the plate; but, should it have been either under or over-exposed, risk of fogging is greatly enhanced. If possible, do not hurry the exposure at any time, especially in bright sunlight, where not the light but the shadows require most consideration.

The axiom, "take care of the shadows and the lights will take care of themselves," is very important to recollect, but frequently neglected. There is so much temptation to expose too rapidly in sunlight that one yields to it occasionally and under-exposes. There is also much difficulty in accurately determining the strength of the shadows under the ever-varying tints of sunlight. To judge accurately of this matter requires considerable practice and a great deal of observation. Practice, and practice only, can be the teacher. "Let not the light lead you to judge incorrectly of the depth of the shadows," is a repetition, in other words, of the adage aforesaid; for its importance can be scarcely overrated, varying, as all shadows do, with the quantity and color of the light.

Every photographer knows the more white clouds the more rapid the exposure, for the reason that the shadows are reduced in intensity by reflections. The contrasts are, therefore, less, and the exposure for both lights and shadows more equalized. It occasionally happens that every effect of light and shadow is reversed in the negative, the sunlight actually becoming the shade,—an anomaly seemingly impossible, but proved a short time since by Mr. Rejlander, who, in the open air, produced a portrait in which the sunlit side was the shadow side, or, more accurately, the darkest side. In explanation, I must say that the color of the setting sun was orange-yellow, and the light reflected from the blue sky more actinic in character than the direct rays of the sun; hence the result. If, therefore, direct light can result in the representation as of shadow in the photograph, at some period there will be a balance between the two, where a sunlit landscape, with apparently bold, strong shadows, would be represented in the photograph as entirely destitute of them,—the effect being that of a gloomy day. This extreme would be rare, no doubt; but, coming as it does within the range of possibility, shows that extraordinary and unexpected differences may exist between the natural effect and photographic reproduction. Photographers should, therefore, cultivate the knowledge of colors, to enable them to judge correctly between the apparent and real intensity and force of light and shadow. The educated eye would tide over difficulties and not know them, that the uneducated would find a rough and unsatisfactory track. Guesswork, though it may be occasionally right, is at best but a wasteful and precarious method of arriving at a result that may be attained surely and certainly, without waste of time or material, by systematic and careful observation.

There has been so much written and said about the manipulations requisite for the production of a good negative, that I will not tire you by going through a number of directions that can be read in any good work on the subject. I will merely glance at a few manipulations for which no special rules have been laid down, and that I have found to answer well in practice.

For keeping plates moist some time in case of a long exposure, or having to take the plates a distance before and after exposure, my favorite remedy is glycerine, mixed with two parts of distilled water, fifteen grains of nitrate of silver, and a drachm of acetic acid to the ounce. With this mixture coat the plate after sensitizing, drain, and it is ready for use. Success depends on the preparation of the mixture and purity of the glycerine. You will say, "Of course it will;" yet many have tried and failed to get good results.

The purity of the glycerine is the first thing to be ascertained, and it may be determined in this manner: Place a little to be tested in a small bottle, adding thereto a few grains of powdered nitrate of silver. If the glycerine be a suitable sample it will remain for twenty-four hours without undergoing any perceptible change if kept in the dark; whereas, if impure, the silver addition will render it almost immediately brown and muddy. Of course, a sample of this kind must be rejected, as its use would only plunge the photographer into difficulties. Having once satisfied ourselves that the glycerine is all right, add the water, silver, and acetic acid; place the whole in the sun for a few days, or until there be no further deposit; filter, and the preservative is ready for use, and will last in good working condition till used up. I have some in first-rate condition now that has been made and frequently used for the last two years.

For very long exposures I prefer to wash the plate with distilled water previous to the application of the preservative. I fancy, by so doing, there is less inclination to fog. I must tell you there is a gradual diminishing of sensibility, so that at the end of six hours three times longer exposure is required than during the first hour, and this is about half as long again as with the ordinary unprepared wet plate.

If re-intensification be required, pyrogallic and citric acid may be used, with the addition of twenty-five per cent. of acetic acid. This is required on account of a great tendency to stains and discoloration these plates have, if long kept. The acetic acid seems to be quite a panacea for this kind of evil. Should a plate become stained by any chance (either with or without the preserver) during re-intensification, it may be partially remedied if very bad, and quite if only slightly, by pouring over the thoroughly-washed plate a saturated solution of bichloride of mercury, then again thorough washing. This may be repeated several times if necessary, alternating with a dose of cyanide. Very stained and discolored pictures can thus be rendered serviceable that would otherwise be perfectly useless.

I will not longer trespass on your patience, for, as I have already said, I do not suppose I have told you anything particularly startling or new; but if I happen to have suggested or re-suggested anything that will be of assistance in a case of difficulty, the purpose of this paper will have been answered, and I shall congratulate myself that I have not taken up your time to no purpose.—*Read before the N. L. P. A.*

ON CLEANING GLASS PLATES FOR PHOTOGRAPHIC PURPOSES.

BY L. G. KLEFFEL.

FOR cleaning new plates I proceed in the following manner: Upon a rough, unplaned board, the plates are laid side by side, convex surface uppermost.* A mixture, consisting of equal parts of sulphuric acid and water, is prepared in a saucer, and, by means of a pad of old linen or flannel, rubbed upon the surface of the plates in turn. When the last has been so treated, the plates are turned over, and the acid applied to the reverse sides. Many photographers immerse their plates altogether in acid, but this is an operation which I do not recommend, inasmuch as more acid is required, and the purpose to be effected (viz., the solving and removing of the dirt and grease) is much more perfectly performed by rubbing to and fro upon the surface.

When the last plate has been treated with acid, I lay them all

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* Only plate glass is perfectly flat, the other descriptions being bent in a slight curve, which increases with the size of the plate. For this reason, in order to obtain sharp definition, the convex side should be used for the reception of the image, as this surface approaches in form to that of the lens.

(beginning at No. 1) in a large vessel of water, changing the latter once or twice, and washing the plates separately with a cloth. If the plates have been properly washed, the water will flow equally and without impediment, over their surface, when removed from the vessel, and this is a sure sign of the absolute purity of the plates. The principal part of the operation follows next, viz., the drying, which must be very carefully attended to, for it is only possible to obtain a perfect result when the whole surface of the plate is damp; if the glass has dried in places before being rubbed with the cloth, the result will be imperfect. The old linen used for drying and polishing, ought, previously to its employment, to be boiled with soda crystals, for the purpose of removing any grease contained in the fabric. Two or three of the plates are placed to drain upon filter-paper, but should not be allowed to stand long before being taken in hand upon the drying-table, which is covered with several thicknesses of linen, worn soft and porous by long usage. Several pads of soft linen are laid convenient to hand, and with the first the greater part of the moisture is removed from the glass, placed upon the table convex surface uppermost; the plate is then quickly shifted to another and drier part of the table cover, and, with a second cloth, rubbed briskly and heavily until all trace of moisture has disappeared. The glass is then reversed, and the same operation repeated.

It is important that the operation of drying should not be completed at the spot where the plate is first laid upon the cloth, as the latter, being damp at that point, will moisten the second cloth used, which will thus be incapable of drying the glass surface. Plates cleaned in this manner are in every way ready for use, but may, if it is considered desirable, receive a further polish with collodion or alcohol.

Old plates should be cleaned by immersion in water, and washed without employment of acids, and then cleaned in the same way as new ones. If the old plates have been varnished, they must be placed for twelve hours in hot, strong soda-lye, and then cleansed, also without acids. Care must be taken to remove the old collodion attaching to the edges, which is best done by means of a piece of soft leather.

The cleaned plates are best stacked close against one another, without any insertion of paper between them.—*Photographische Mittheilungen.*

ON EXPOSURE.

BY O. R. GREEN.

(Read at a meeting of the Liverpool Amateur Photographic Association, May 25th, 1869.)

NO definite rule as regards time can be laid down for exposure. I advise every person to adopt some ideal standard of sensitiveness. Most persons who have worked with wet plates adopt the exposure required for them as the standard. If it be wished to try the relative rapidity of plates differently prepared, I think it is better done by using a carrier in a large camera, so that the plates can be placed side by side. If the camera be then pointed at a subject equally illuminated, you will be certain they will receive the same exposure, and can judge of the relative merits of the plates accordingly. It was in this way that I became convinced of the rapidity of the collodio-bromide plates, which, if developed within a week, require about three times the length of exposure I should give for wet plates; but, if I thought of keeping them a month or six weeks, I should expose for at least double the time, and so on for a longer period.

It is extremely difficult to judge of the exact amount of light reflected from a landscape—say, on two similar cloudless days at the same hour—so much depends upon the amount of invisible aqueous vapor in the atmosphere, which reflects the light into the shadows. I think the best plan is to notice the amount of illumination in the shadows of the picture on the ground glass, and judge of the exposure required accordingly. I find the eye is better able to form a correct judgment in this way, than by looking at the landscape direct. If you wish to avoid having dark patches in your pictures, take care of the shadows and leave the lights to take care of themselves till you use the developer. Err on the side of over-exposure rather than on the opposite. You may, to a certain extent, correct the former by after-treatment, but no skill will compensate for insufficient exposure.

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HURRY is a great hindrance to good manipulation.

NEW METHOD OF TREATING A DISCOLORED PRINTING BATH.

BY W. ENGLAND.

WHEN the silver solution has become red or discolored from repeated use, pour into a porcelain evaporating dish, supported on a gas or other convenient stove, and raise the liquid to the boiling-point; continue the ebullition for ten minutes or a quarter of an hour, at the expiration of which time the organic matter will have been precipitated or destroyed. After subsidence and cooling down to the ordinary temperature, the nitrate bath, however much discolored before this treatment, will be found once more quite clear and bright. If the solution should be required for immediate use after boiling and cooling, filtration can, of course, be resorted to in the usual way. Those who adopt this method will be surprised at the large amount of albumen which becomes dissolved by the nitrate bath during once or twice using, and which, by the simple method above-described, will be coagulated and precipitated in the black deposit, which should not, of course, be wasted, but thrown into the receptacle for silver residues. I may also mention that it is necessary to measure the silver solution before boiling, so that an equivalent amount of water may be added to replace that lost by evaporation. If it be suspected that the bath is below the standard strength, the whole or a portion of the water may be omitted. I feel sure that those who once adopt this method of treating the discolored solutions, will forever discard the use of kaolin, as being a much superior and efficient system of purification, less troublesome, and more economical.—*The Photographic Journal.*

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(Written for Photographic Mosaics.)

THE TEA DRY PROCESS.

BY H. J. NEWTON.

THE preliminary steps necessary to prepare the collodion film for dry plates has been so often written, that it can now be dispensed with in giving a new process for producing negatives on a dry sensitized film. I would recommend, however, that the plate, after the usual washings, be placed for one or two minutes in a two or three-grain solution of chloride of sodium, and then washed under the tap before immersing in the preservative solution. I would also say to those trying the dry formulæ, to disregard the advice, so often repeated, that a *very* old collodion is necessary.

Always use the collodion and bath that will make the best *wet* negatives. I have intimated that I have a new process. The things new consist, however, mainly in the preservative and developer.

The preservative is a strong decoction of Japanese tea. Put two large tablespoonfuls into a bowl, and pour on ten or twelve ounces of boiling water; cover over and keep hot for one or two hours; then filter, and it is ready for use. Put no saccharine matter or any other substance into it. I would take the opportunity here of saying to those using coffee, that in my hands much superior negatives are obtained by using the coffee perfectly free from any other substance. The developer which I use is made as follows, and in the order given:

Water, ...	16 ounces.
Gelatine, ...	16 grains.
Protosulphate of iron, ...	1 ounce.
Double sulphate of iron and ammonia,	1 "
Glacial acetic acid, ...	4 drachms.
Ammonia, ...	16 drops.
Tartaric acid, ...	16 grains.

This developer should be kept in the dark, as it becomes colorless in the light and worthless. It will keep for months in the dark, but in a few weeks it becomes opalescent, as the gelatine commences to precipitate; but in this condition it works finely. In time the gelatine will go down, but the developing quality is not materially changed. After the plate is exposed, wet the surface thoroughly, and then cover it with the developer; pour this off into a small dish or wide-mouthed vial, and again on to the plate. This should be repeated several times, to secure evenness of action. Finally, while the developer is on the plate, put two or three drops of a ten-grain solution of silver into the dish or vial used, and again pour the developer into it, and again on to the plate. The picture will appear and go forward almost as rapidly as on a wet plate.

Add silver, if required, to give it the requisite intensity; fix in hypo with more gold and silver in it, which will prevent its being reduced in fixing.

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(Written for Photographic Mosaics.)

THE WHOLE STORY.

BY EDWARD L. WILSON.

WHILE there is no end to the formulæ offered for producing photographs, the whole secret, after all, is in adopting some reliable method, and in sticking to, and persevering in, it, conservatively, until you make it work to suit you. Use the best you can get of everything, and then what follows is the whole story:

NITRATE BATH.

Water,	36 ounces.	
Nitrate of silver,	3 "	(troy).
Iodide of potassium,	6 grains.	

Filter, and if you prefer it acid to having it neutral, a few drops of nitric acid, C. P., will accomplish your desires in that direction.

COLLODION.

Ether,	5 ounces.
Alcohol,	5 "
Iodide of ammonium,	50 grains.
Bromide of potassium,	20 "
Papyroxyline,	20 "

DEVELOPER.

Water,	64 ounces.
Protosulphate of iron,	4 "
Acetic acid,	2 "

to every 14 ounces of iron solution.

FIXING SOLUTION.

Hyposulphite of soda.

With the above the best of results may be secured.

For printing albumen prints use the following

SENSITIZING SOLUTION.

Water,	16	ounces (fluid).
Nitrate of silver,	2	"

Separate one-fifth in solution, and add liq. ammonia until the brown oxide of silver is redissolved, and then add it to the other four-fifths again. Add C. P. nitric acid until all precipitate is dissolved.

TONING BATH.

Water,	32	ounces.
Acetate of soda,	60	grains.
Table salt,	60	"
Chloride of gold,	4	"

Where black tones are desired, add four grains of nitrate of uranium. If warm tones are desired, omit the uranium. Both the gold and uranium must be neutralized, before adding to the other solution, with bicarbonate of soda.

FIXING BATH.

Water,	32	ounces.
Hyposulphite of soda,	5	"
Carbonate of ammonia,	1	ounce.

This is the whole story. Test it without haste, carefully, thoughtfully, earnestly, perseveringly, and always regarding cleanliness, and you *must* produce good work.

HOW TO MAKE A BACKGROUND.

BY J. C. LEAKE.

PROCURE a frame of wood of the required size; about eight feet high by seven wide will be that most generally useful. This should be strongly made, and not less than one inch and a half in thickness. Over this strain tightly a piece of stout calico or sheeting, nailing it closely round the edges. Next obtain some white lining paper, which may be bought at any paperhanger's, and paste it tightly over the canvas, letting the edges lap over about an inch, and being careful to avoid creases. When thoroughly dry, take some of the brown paper, known as "carpet paper," which may be procured at the upholsterer's in sheets about five feet wide, and of any length, and having cut it to the length required, damp it thoroughly on both sides. Now paste the edges for about six inches round, and the lining paper also, except in the centre where the join will be, and lay the large sheet carefully on the frame, which should be laid flat for the purpose. Having pressed out all air-bubbles, and pressed the paper tightly down round the edges, next cut a strip wide enough to cover the remaining space. Damp as before, and having pasted this all round, lay it down smoothly, taking great care with the join. Should any paste be squeezed out of the join, wash it off with a large soft brush and plenty of cold water. It will be as well to wash the background all over when it is completed, under any circumstances. Allow the frame to remain flat until the paper is thoroughly dry, when it will be quite flat, and, if properly done, the join will be scarcely perceptible. It is better to make the join the upright way of the background. This brown paper makes an excellent screen, coming a very good color in an ordinary room; but if required of a different color, it can be altered by the following method: Melt some common size in a saucepan, and add to it an equal bulk of warm water. Strain it, and with a large soft brush lay a good coat over the paper. When quite dry, paint it with the following mixture: Common size and water in equal parts; to which add blue-black, whiting, and Venetian red, as required for thickness and color. Strain while warm, and set it aside until cold, when it is fit for use. Lay it over with a large flat brush as quickly as possible, and smooth it, after the whole surface is covered, by brushing it in a vertical direction, if possible in one stroke from top to bottom.

The above makes a capital mixture for coloring the furniture and accessories of the studio. When to be used for this purpose, it should be mixed rather thicker than for the background. As all distemper colors dry very much lighter than when mixed, they should be tried by painting a small surface first. The color can then be altered by adding more blue-black if too light, or whiting if too dark.

The distemper colors are best for backgrounds, but some prefer what is called "flatting," for furniture and accessories. To prepare this, take dry white lead, or, if a little gloss is no objection, the ordinary ground white lead, and lampblack and Venetian red. Mix until the required color is obtained, add a little japanner's gold size, and dilute with turpentine to a convenient thickness. No oil should be used, or the paint will dry glossy.

Flatting is the most permanent when it has to be handled much, but for all ordinary purposes distemper will be found to answer; and it possesses the advantage of being the cheapest.—*The Illustrated Photographic Almanac.*

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PRINTING.

BY ALIQUIS.

THERE need be little hesitation in using any of the respectable makers' paper, but it is best to procure those sorts which have a good body of albumen on them, and all kinds of cheap resinized papers should be carefully avoided. They spoil your bath, and almost invariably give dubious prints —prints that hang, as it were, in *doubt* between a kind of vigor and absolute weakness. For cartes, and small pictures, paper which has the albumen well on the surface is the best; but for larger pictures, those particularly with a tendency to harshness, an albumenized paper which shows by a flattish surface that the albumen has sunk well into the pores, is perhaps to be preferred. Your paper being chosen to the best of your wisdom, the next business is to silver it. In doing this, great care should be taken to have the paper perfectly dry before it is put on the bath. Even though kept in a dry store-room, it will be found that it has contracted a considerable amount of moisture from the atmosphere, and it should, therefore, be dried thoroughly, sheet by sheet, immediately before putting on the bath. If this be not attended to, you can never promise yourself immunity from the vexation of dull prints. In fact, the whole operation of sensitizing should be conducted as much as possible with a view to keeping the silver image upon the surface of the paper. This not only renders the impression in every way more brilliant, but also easier to tone, fix, and wash, and affords, I believe, a greater warranty of the resulting print being permanent.

Too many sheets, as my readers are well aware, ought not to be silvered upon the same surface of the bath. "But how many will be too many?" Two. The bath ought to be gently agitated to change the surface after each sheet has been removed, especially if the removing has been done as it ought to be, viz., very quietly and slowly, so as to lift as little as possible of the liquid. Some printers waste baths enormously by whipping the sheets off much as if they were pulling them out of the fire. After hanging a short time to drain, the sheets ought to be dried and *kept* dry. No prints can be good taken on damp paper. The backs of the pressure-frames, therefore, should be kept well dry, as dry as the atmosphere of a comfortable room, so as not to cause the paper to expand and pucker. If due attention be paid to these little matters, the difference in your prints will astonish you, particularly if you have been "awfully bothered with ugly, mealy prints, in dull, damp weather."

There is another advantage also in keeping the paper dry, and that is, it does not become yellow so rapidly. Paper kept carefully dry will print tolerably well several days after sensitizing. I will conclude this paper with some memoranda on the silver bath.

It should be made with as pure silver as can be got, *i. e.*, with silver as free from acids and inferior compounds as can be obtained at ordinary market prices. That known as double crystallized is, when good—and any respectable dealer keeps it good, I believe—the best for this purpose. There is no need to use distilled water if you have water of ordinary purity at hand; but if you have any doubts upon that point, by all means use distilled.

It is the wisest and most economical plan to allow your bath to remain in the sensitizing dish, to which you should provide a cover, in order to prevent dust and evaporation. Skim the bath carefully before commencing to sensitize, to remove any gum that may have gathered on the surface.

When the bath discolors, or becomes so clogged with organic matter as to show signs of fermentation, or when the prints begin to show a bluish, veiled appearance on the surface while being impressed, bottle it carefully, and treat it with a good dose (from ten to twenty drops, according to need) of a strong solution of permanganate of potash. It will do no harm, though slightly in excess of the organic matter in the bath with which it is to unite. After shaking the bluish-black liquid which results from this addition well up, it may be immediately filtered clear. I believe the bath will be found to be now as good as when new—certainly as good as if it had had alkali added, and stood a fortnight in the sun.

Finally, as long as you can, by purging, get an old bath to do duty, never make a new one. It *is* possible to recover all the silver contained in a discarded bath; but it is very doubtful whether you may have the time, the means, or the skill to do it. We must be economical in these times.—*From The Illustrated Photographer.*

THE POSE.

BY H. P. ROBINSON.

LONG experience will show that the two sides of every face differ. This is very evident in many faces; and in all, however regular the eyes may seem, or however straight the nose may appear, close observation will discover that one side is better than the other. It is this side that should be taken. Even in a full or nearly full face, this variation should always be noticed and taken advantage of.

In photographic portraiture the face should, as a general rule, be turned away from the light. If the face is turned to the light, however delicate the half-tones may be, the line of the nose will be partly lost in equal light on the cheek behind it. Painters occasionally represent faces in this position as regards the light, but then they have the advantage of color to produce relief. The only exception to this rule—that the face should be turned from the light—is in the case of a profile, or the profile showing a glimpse of the off eye when the nose comes clear against the background. For these reasons—that is, because it is necessary to choose which side of the face is to be represented, and because the face must be turned from the light—it is well to have a studio so constructed that the light can be obtained from the right or the left. In a ridge-roof studio, with one side glass and the other opaque, both ends should be available for use. It is also well to have it sufficiently wide to enable the operator to work diagonally, and thus get a modification of the shadows without the use of reflectors.

Having decided the side to be taken, which also determines the general direction of the light, the next consideration is that of attitude. As regards the position of the head, Burnet observes: "Every one who takes the trouble to reflect must perceive that all faces contain two points of view, where the character is more or less developed,—a profile, and what is termed a front view; and that the seat of a strong likeness lies sometimes in one greater than in the other. They must also perceive that what is called a three-quarter view of the head gives the artist an opportunity of representing both; independent of which advantage it has a greater variety in the forms, and gives an opportunity for introducing a greater breadth of light and shade, and also of showing the ear, which is often a beautiful feature."

A single figure should be complete in itself; it should not appear as though it had been cut out of a group, and it should be incapable of having another figure added to it without injury. The head being the chief object, every line should be composed in relation to it, and the student will find the rules of pyramidal composition invaluable to him here. He must consider contrast of lines and balance, variety, repose, and, above all, unity and simplicity; bearing in mind that the head is the principal object, to which everything is to be subordinate, which is to receive the sharpest focus, the highest light, and the chief attention; after which, the hands will claim consideration. The hands will be found very useful in repeating, in a minor and subordinate degree, the mass of light presented by the face. They have the advantage, in one respect, of not being of so much importance as the face. They may be displayed (always without affectation) if they are fine in form, or they may be hidden if necessary.

The action of the figure should be that which is most common to the individual; such a position as shows it to the best advantage. No violent action should be allowed; no appearance of strain. Some photographers seem to think that grace consists of twists, and make spirals of their figures, especially ladies, by causing them to turn their heads over their shoulders, and try to look down their backs out of the corners of their eyes. The absurdity and affectation of this position is caused by exaggeration. A position approaching to it, but without the strain, is exceedingly graceful if the figure should be sufficiently easy and pliant to allow of this pose. It cannot be too strongly impressed on the student that the possibilities of the figure must be considered before the attitude is chosen; every figure will not allow of every attitude, any more than a decrepit old man of eighty or ninety could perform the feats of a skilful acrobat. Some figures are graceful in one position, while they would be awkward in another; probably still more graceful in a figure it suited. However graceful a figure may appear which has cost some effort in the sitter to attain, it does not compensate for the unaffected air and repose derived from the head and body placed in one direction, as we see in the grand portraits of old men by Titian, Vandyke, and Raphael.

The student will do well to observe attitudes assumed in everyday life, and adapt them to his art. When he sees a beautiful attitude, let him speculate upon the cause of its being beautiful, and he will find that it depends for its effect on its consistency with the rules of composition; and although these rules will not supply him with imagination sufficient to enable him to perpetually invent new arrangements, he will find they aid him very materially in giving expression to his inventions, and will prevent him being extravagant or exaggerated in his arrangements of the form. He should also store his mind with incidents suitable to his sitters, and he may then, perhaps, be able to give less occupation to the eternal book we see in the hands of photographées almost as often as a roll of paper is represented in the statues of statesmen.

A vignette head, when nothing more than the head and shoulders is seen, should never convey the impression that the sitter was lounging in a chair or leaning on a table; the reason being, that as the table or chair is not visible, the figure would appear out of shape and deformed. As a general rule, the shoulders should appear level, as though the subject was standing. A little variation between the direction of the head and shoulders will always give variety and animation. The lighting should be more delicate than that suitable for other portraits, and the background should always be light. If the white margin to the vignette be very slightly tinted in the light after printing, the delicate effect will be increased; but, when this is attempted, it is usually overdone, and then the effect becomes heavy, and worse than if the white paper had been left pure.

In conclusion, make it a constant practice, before removing the cap from the lens, to first give a rapid glance at the sitter, to see whether the outline of the figure composes well, that the light and shade is massive and round, and that there appears some indication of the expression you desire on the face of the sitter. If there is a lack of either of these qualities, do not waste your plate until you have got them before your lens.—*Pictorial Effect in Photography.*

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DEFECTS IN THE NEGATIVE—CAUSES AND REMEDIES.

BY LAKE PRICE.

IT is well to acquire the habit of *never passing an imperfection*, and not resting satisfied until in all the various processes the *one* causing it has been discovered.

The first defect we will notice is of frequent recurrence; it is a general obliteration of the forms of the subject in an *opaque film*, which prevents them from being clearly distinguished, in whatever direction they may be viewed. This is termed "fogging," and is caused in a variety of ways. It may result from the unskilful use of the developer itself; if it is of too great strength in warm weather, when it should have been reduced in power by the addition of distilled water and acid, fogging will ensue; or, at a more moderate temperature, prolonging the time of development beyond a certain limit, will cause the same blemish. If weakening the solution in the one case, and shortening the development in the other, does not remedy the evil, the nitrate bath must be tested for alkalinity with *reddened* litmus or turmeric paper.*

If its condition is found satisfactory, *i. e. neutral* or *just* acid, which will be seen by its allowing the reddened litmus paper to retain its color, the fault is not there. If it restores it to its former tone it is *alkaline*, and a drop or two at a time of the dilute nitric acid must be added; *testing between each change* with the *blue* paper, so as not to exceed the quantity necessary, which will be when the paper is tinged with *red.* Stir with a glass rod during the time, that the drops of acid may be equally distributed *throughout* the bath solution, and their action not confined to the mere surface.

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* Blue litmus paper, when used to test for alkalinity, is first reddened. This is best done by taking out the stopper of an acetic acid bottle, and holding a strip of the paper in the *fumes* inside; it will immediately change from blue to red. Actual *contact* produces a less sensitive test-paper, its texture being completely saturated with the powerful acid.

When there is only a *very slight* tendency to fog, it is better not to touch or alter the bath; by using a more highly colored sample of collodion perfect clearness of definition will be restored to the film, whilst at the same time every plate of such quality of collodion that is dipped will tend gradually to displace, more and more, the small tendency to alkalinity existing in the bath.

Indeed, with such a combination and balance of properties, an *acid* collodion and a *neutral* bath, most excellent qualities are produced in the picture; the bath, on the one hand, possessing the power to accelerate the action and delineate the difficult colors or obscure radiations from the subject; whilst its inclination to fog is bridled by the acid state of the collodion, which keeps the general definition of the plate and its darks and half-darks bright and clear.

Should the bath, when tested, be found in good condition, the fault may be with the acetic acid; if it is deficient in strength it will not moderate sufficiently the action of the pyrogallic or iron in the developer: on adding about a sixth to one quarter more than its original proportion to the solution clear plates will be obtained; for extreme heat use citric acid. When not arising from these sources, fogging may be caused by *diffused light* having acted upon the film either in the operating-room, the slide, or the camera, or from the reflection of light from *bright surfaces* in the studio, or portions of sky acting directly on the lens. Carelessness in the operator, viz., handling the nitrate bath dipper with dirty fingers, contaminated by contact with the developing solution or fixing hypo, will creep down the dipper into the bath solution; any messing or allowing splashes of chemicals to fall into the bath *must be avoided;* it should be kept rigorously covered with a loose cap.

An *old bath* has occasionally a tendency to fog, from the accumulation of organic matter and presence of oxide and *nitrite* of silver; the best remedy in this case is to replace it by an entirely fresh one.

Lastly, and more frequently than any of the preceding causes, *over-exposure* at *large apertures* of double lenses is a fertile source of this imperfection, especially when used in the open air and their surfaces carelessly exposed to the action of diffused light. This especially applies to the portrait, orthoscopic, doublet, and rapid rectilinear. *Shade the front of the lens more completely.* One general line of demarcation exists in fogged plates, which materially assists the operator in discovering the origin of the evil: it is that when fogging proceeds from impurity in the chemicals it is *on the surface*, and is removable by gentle friction with the finger. If it has been produced by over-exposure or diffused light it is *in the body of the film*, as much as any portion of the subject itself, and is incapable of removal.

The next blemish we will notice, is the direct opposite to the fogged appearance on the plate: it is the insensitiveness evidenced by the too great quantity of *bare glass* seen on the plate; this is caused probably by *acidity* of the bath, which must be tested for it; if there, its presence will be denoted by the greater or less degree of intensity of the *red* color which it imparts to the litmus paper, and according to the proportion, so must the quantity of the alkali, applied to rectify it, be regulated. Some operators recommend ammonia for this purpose; the writer advises drops of a solution of carbonate of soda, dissolved in distilled water, to be used in preference, having found it in practice give much better results. It must be applied very gradually, and the test-paper and stirring-rod used as mentioned before.

If on testing the bath its acidity is not considerable, and the operator has been working it with a rather highly-colored collodion, instead of meddling with the bath the *balance* before mentioned can now be restored in the contrary direction—namely, by using the most *neutral* sample of collodion at hand, which will be found as efficacious in restoring sensitiveness, and giving delineation of forms in the bare portions of glass, as the acid collodion was in clearing the obscured plate.—*Manual of Photographic Manipulation.*

HOW TO SENSITIZE THE PAPER.

BY JABEZ HUGHES.

FILL your dish, to the depth of not less than half an inch, with a 60-grain nitrate of silver solution made as usual. Cut your paper to convenient sizes suitable to your negatives, and lay it, if it is albumenized paper, on its glazed or albumenized side downwards on the surface of the silver solution; if it is plain paper, lay it on its smoothest side. When it has lain for about a minute, lift up one corner with the pincers, and, if there are any air-bubbles, remove them; replace the sheet, and allow it to remain five minutes on the solution, then lift it off, taking care no solution runs over the back, and suspend it, with an American clip, to a line, in a closet or other dark place, away from the light, where it can dry spontaneously. It is then ready for use.

Your paper ready, place your negative in the printing-frame, collodion side uppermost—be sure the glass is quite clean—and lay the paper on it, prepared surface downwards; put a few sheets of blotting-paper behind it; next put the hinged back in its place, and secure the whole tightly with the screws or other fastenings provided.

It is essential that the paper should be in very close contact with the negative to produce a "sharp" print, and you must observe that this pressure is uniform, to prevent breaking it.

Expose it to the light, and allow it to remain until printed. How long this operation will take, depends on the power of the light and the density of the negative. In summer, a very short period is sufficient; and, in winter, a whole day or longer may be required. To know how it is proceeding, undo the fastenings *on one side of the frame*, and, by lifting up half of the hinged back, you can, without disturbing the position of the negative and paper, examine the latter, and observe its progress. First, the general outline is marked; then, the deep shadows; next, the lighter shades; and, finally, the delicate half-tones. By these latter you must be guided. You must print till they are not only clearly out, but a few shades deeper than you would like them, because, in the subsequent operations, they will become lighter, and, unless you make this allowance, your print, when finished, will not be deep enough. A little experience will tell you how dark you should print. In printing portraits, you must judge entirely by the *head;* get out all the half-tones clear and distinct, so that the ultimate picture shall show the features nice and round, not buried in black shade from being over-printed, or pale and flat from under-printing, but just such soft gradations as will make a pleasing likeness. This depth obtained, take it out of the printing-frame, and it is ready to be *toned* and *fixed.* The operations of preparing the paper, putting it into the printing-frame, examining it, and taking it out, together with the toning, should all be done either in yellow or very dull white light; for, although the excited paper is not nearly so sensitive as collodion, yet a strong light, especially sunshine, will quickly spoil it for good printing. —*The Principles and Practice of Photography.*

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DEFECTS IN PAPER PRINTS.

BY JABEZ HUGHES.

THE *paper does not print equally all over; has marbled or mottled spots.*—The silver solution is too weak, or the paper has not been floated a sufficient time. If the *silver-meter* be used, and the strength kept up to at least 60 grains, this defect will never occur.

The print, when finished, has a disagreeable yellow tint, and, on looking through, yellowish-brown opaque patches are seen.—The print is not fixed; the hyposulphite is too weak, or has been in use too long, or the print has not been immersed long enough to dissolve the chloride of silver.

The whites and blacks are very brilliant, but a deficiency of detail in both.—The negative is at fault, under-exposed.

The prints are weak, cold, and slaty.—Under-printing and over-toning are the general causes. The hyposulphite solution may be too strong. Over-exposed negatives produce weak prints, deficient in proper contrast.

The prints are gray and mealy. — Over-toning and defective paper.

Red spots, streaks, and markings.—Defects in the paper, or the albumenizing, or both.

Prints will not readily tone, but remain of a brown, leathery hue. —Toning bath too alkaline; chloride of gold deficient in strength; the toning bath exhausted; the paper kept too long before being printed on, or, after being printed, kept too long before toning.

Metallic smears, spots, stains, finger-marks, etc.—These defects nearly always arise from bad manipulation, handling the paper with dirty fingers, allowing solutions to splash, putting the paper on a dirty table, dust and dirt in the printing-frame, or on the pads used in the latter, or similar causes, or they may occur from bad paper.—*The Principles and Practice of Photography.*

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(Written for Photographic Mosaics.)

THE MAGIC LANTERN IN ITS RELATIONS TO PHOTOGRAPHY.

BY EDWARD L. WILSON.

FOR ages the magic lantern has attracted the attention of the philosophical and the curious. But for ages the great difficulty of producing a concentrated light of sufficient intensity, and picture slides of sufficient excellence, has operated against its extensive use.

An efficient and convenient form of lantern with cheap and correct slides, such as only the photographer can produce, is more and more a felt necessity, among those who appreciate the value of visible illustrations.

A single glance at a good picture gives a truer and a more lasting impression than pages of description, even though committed to memory.

The approximation of the current literature of the day to ancient hieroglyphics is philosophical. It is highly appreciated by young and old; by the ignorant and by the learned.

Our educational system has undergone a marked revolution. Object teaching is now in vogue. Diagrams, pictures, and the objects themselves, when practicable, are now brought to bear in schools of every grade, and on subjects of almost every variety.

As a means of imparting instruction and of affording rational amusement the lantern has peculiar advantages.

A small picture, seen by passing it from hand to hand, seems comparatively tame; but when presented to all eyes at once, enlarged to life size and to life-like appearance, it is viewed with cumulative enthusiasm. It arrests the attention as when "there came forth fingers of a man's hand, and wrote upon the plaster of the wall in Belshazzar's palace."

The projected pictures can be enlarged or contracted to suit circumstances, or be made to "right and left face" with magic facility.

There is none of the gloss of varnished surfaces to put the picture "in a bad light."

There would be great inconvenience in mounting and changing real ten-foot picture frames and drawings on the wall; but lantern-slides slide in place conveniently and produce no disturbance among the spectators. These real ten-foot frames and drawings, would also require much space for storage, and be liable to much damage while overhauled in making selections; while picture-slides can be safely kept in small space, and selections can easily be made.

Moreover the manufacture of slides for the lantern promises to be a remunerative branch of business, which makes our subject more interesting to photographers.

For large public exhibitions a chemical light is essential to success; but for ordinary occasions Mr. Marcy's Sciopticon, an improved magic lantern with a coal oil light, gives very satisfactory results. Its invention and introduction are among the new things of the year. It gives such a strong light, and is so portable, that it must open up a field for slides, and thus prove a help-meet to photography; and the two combined impart much pleasure and instruction. Photographers should then begin to direct their attention towards the collection of suitable subjects.

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DARK-ROOM "DODGES."

BY J. C. L.

THE GLASS.—"Take a plate of glass, clean it, and coat with collodion." Such are the directions given in one or more of the almost numberless "guides" on the royal road to photographic eminence; or, if anything more be added, it is in the shape of a footnote to the effect that plates of the usual sizes can be obtained at Messrs. A. and X.'s photographic emporium, but not a word about the quality or kind of glass to be used, or the failures likely to occur through the use of an unsuitable material.

Now we happened to visit the studio of a well-known photographer the other day, and were surprised to find him busy with one of his boys cleaning and arranging plates. Each plate was examined and carefully placed in a grooved box. Inquiring how it was that our friend could afford to spend valuable time on a matter which seemed to be of small import, we were informed that it was really a saving. "For," said he, "I find some of these plates rough on one side. Now if I coated that side I should lose all the time, labor, and material which will now be expended in taking a *successful* negative. Beside, several glasses in this packet are cracked about a quarter of an inch into the plate. This would probably not be noticed except in a good light, and if a negative were taken upon one of them, it would be broken as soon as pressure was applied in the printing frame; so I spend my labor to save it." This, then, is evidently a dodge worth thinking of.

Coating the Plate with Collodion.—We need not refer to our friend the text-book on this point. We all remember how we learned the paragraph treating of this operation by heart, before attempting so arduous an affair as it then seemed to us; and we also recollect how gloriously we failed, and got more collodion up our coat-sleeve than we kept on the plate. But even when we had mastered the operation much remained to be learned.

Many a plate was rejected on account of a small bubble or fragment of dried collodion which drifted out of the neck of the bottle. The dodge was to at once coat the plate again before pouring off the whole of the superfluous liquid, so as to carry the fragment off the plate, but it was a long time before we learned this trick. Now we often adopt it, in fact always when the collodion is thin, and it is very useful indeed. Some years since, when working positives upon the enamelled iron plates, we found this to be the only way in which we could get body enough to make a satisfactory picture.

Always coat the plate so that the upper part—that first coated —may be used for the sky or upper part of the negative. This will be best because it is mostly smoother and thinner than the end from which the collodion is drained off, and beside the advantage of having the more heavy portions of the plate disguised by the more prominent parts of the picture in the foreground, the thinness of the film will give rather less density in the sky, and more at the bottom of the picture, where it is frequently wanted.

Bath Dodges.—To some photographers the nitrate bath is a constant source of trouble and difficulty. "How do you keep your nitrate bath in order?" we were asked the other day. "Simply by leaving it alone," was our reply. The fact is that if a pure sample of nitrate of silver be used, a bath will work well at once, and if left alone and not messed about, will keep in order to the last drop. Nevertheless some care is required, and we will describe the "dodges" we adopt to keep the bath up to the mark.

The first thing required is to mix a good quantity of solution, say twice that which the bath will hold. This will effect a saving both of time and silver. Having done this, coat a plate with collodion, and leave it in the bath all night. In all probability you will have a bath in good order in the morning. Should there be a slight tendency to fog, add a drop or two of dilute nitric acid; but be very careful not to put too much, for the more nearly neutral the solution is the better, both as to sensitiveness and quality of the negative. When the solution is working well leave it alone, and keep to one collodion. If you use a glass bath, which is best, make a mark about an inch below the usual level of the solution, and as soon as that quantity is used, fill up to the old level with new bath. This will keep up the strength of the bath, and mostly prevent the undue accumulation of ether and alcohol, as well as the supersaturation of the solution with iodide of silver.

Do not filter the bath too much. If your plates are cleaned well, and the solution is kept well covered from dust, once a week ought to be enough, except in case of accident, or when a very large number of plates are excited. Perhaps a better plan than filtering is to pour the solution into a clean bottle over-night, and in the morning to replace it in the bath, pouring it back very carefully so as not to displace the sediment. If this be skilfully done, all but about an inch of solution may be replaced pefectly clean. When you use filtering-paper take care that it is good and clean; some papers contain hyposulphite of soda, and we need not describe the consequences attendant upon the use of this. Look well after the dipper. It often happens that the ledge upon which the plate rests is rough at the edges, and these roughnesses hold the dirt; it is well, therefore, to frequently clean these out. Rinse with dilute nitric acid and with distilled water whenever you filter the bath. If the solution has been much used, it is a good plan to pour it into a flat dish and place it in the glass-room once a week; in fact, to let it spend its Sunday out. This will allow the ether and alcohol to evaporate, and save the streaks and marks which occur, if they be present in undue proportion.

When exciting a plate do not soak it. As soon as the film is creamy take it out of the bath. We think that in many cases plates are spoiled through being placed and kept in one position for several minutes. Let any one take two plates, placing one in the bath, allowing it to remain five or ten minutes; let the second be kept moving all the time, and be taken out as soon as the greasiness disappears. If now exposed and developed the difference will be most striking. The unsoaked being cleaner, clearer, and much more brilliant and effective than that which had received prolonged immersion in the solution.

Although anything pertaining to the exposure of the plate in the camera cannot be strictly called a dark-room dodge, we think that a hint or two on a matter so important may not be out of place in this article.

In the first place we may notice that the difference between a skilled and an unskilled photographer is at once seen in the method adopted by each in the use of the camera.

The tyro is so fond of the instrument that he will arrange every detail upon the focussing-glass, while the older practitioner will only use it for its legitimate purpose—that of adjusting the focus of the lens.

The advantage of adopting the latter course will be obvious if considered for a moment. In the first place, the size and position of the model are presented under more favorable conditions for observations than the image of the same on the focussing-screen. The general effect can be better observed, and matters of detail more easily arranged; moreover, it is far pleasanter outside than under the focussing-cloth, the wrapping of which round one's head does not add to the dignified appearance of the operator. When the model is posed, and drapery and accessories are arranged, then a look at the screen, to see that the image is sharp and in its right position on the plate, is all that is required. The image on the ground glass of a camera is often very illusive. It looks so pretty that one is often tempted to take it at once, without making allowance for loss of color or the various defects of photography; hence it is better to arrange without this source of beguilement, and only to use it for the purposes we have named.

The question is often asked, "How long ought I to expose a plate?" and it is one not easily answered. It all depends on what you are aiming at. We will suppose the normal time of exposure to be twenty seconds for a portrait. Now the photographer has to make a portrait of a young lady or gentleman with a very flat face, without lines, or any prominent feature. For this he will probably reduce the exposure some four or five seconds, in order to get as much boldness and relief as possible. Perhaps the next sitter will be an old gentleman or lady whose face is rugged and full of deep lines, and should he under-expose this plate, all these would be much exaggerated. He therefore gives this five or more seconds beyond the normal time, in order to soften as much as may be the harshness of the various lines and defects. In fact it is of no use to adopt the Procrustean method in this matter. The exposure must be adapted to the model, and calculated to produce a given effect; and it is in this matter that the skill and judgment of the operator is made manifest.

Before quitting this subject, a word or two may be said as to the best way of managing dresses of very light material, such as white, blue, or mauve silk, muslin, etc.

In the first place, much depends upon the arrangement of the drapery. Don't get a lot of small folds, but a few large and massive ones: by this means a great part of the material will be in half-tint, only the more prominent portions being very strongly lighted. Use as much side-light as possible, to throw the folds into relief; and then expose for the face, leaving the light dress to take care of itself. Avoid the use of dark background and accessories, and make no more contrasts than are requisite to produce a proper amount of relief. If these precautions be taken, very little difficulty will be found in producing at least respectable results, and it will be but rarely that we shall have to fall back on "Cardinal's" or other kindred dodges.

Developing Dodges.—So much has been written on this subject that one is hard put to it to find anything new which may be said, while it is patent to every careful observer that scarcely any two photographers work exactly alike. One will "go in" for strong developers and rapid action, another for weak solutions and slow development, and so on, almost infinitely. But perhaps both are wrong in adopting one method for all purposes. In some cases a weak solution will be better than a strong one, and *vice versâ*. For instance, in the case we have mentioned of a very light dress, a far softer effect will be produced if a weak developer be used. Our plan is to flood the plate (which, as we have said, should be fully exposed) with a dilute developer, so as to wash off as much of the silver as possible. This will leave a thin image, with all the detail, even in the lightest parts of the picture. But we need hardly say that such treatment would not answer should the model be draped in dark cloth or velvet. In this case a stronger solution should be used, and as much silver kept on the plate as can be used without staining it. It is well not to use an iron developer too freshly mixed. The deposit is much finer and more non-actinic, if the developer is a day or two old. Above all things, don't use too much acid. We believe many photographers use far too great a quantity. If the chemicals are in good order, plates clean, and diffused light kept out of the camera, very little need be used. We have worked for weeks together with one to two drachms of "glacial acid" to the quart of solution; of course using it a day or two old.

If Mr. Sutton's theory be true, and there seems no reason to doubt it, that acid will really destroy the latent image, the importance of this will readily be seen. Finally, on this point, always develop from the bottom of the negative, as any slight inequality of action will be less seen in the foreground than in the sky or upper portion of the picture.

Intensifying Negatives.—It might often be said that intensification is the process by which good negatives are spoiled; for no part of the process of taking a picture demands so much care on the part of the operator as this. Not that it is difficult to obtain any amount of density, but that it often happens that the negative is made so intense as to produce harshness and contrasts of light and shade which are far too sudden and violent. The whole question of intensifying negatives seems to us to require some consideration.

As we have before remarked, the intensifying process is one of great delicacy and importance. If a negative be too thin, the prints from it will be "thin" and wanting in vigor; if too thick, hard and "snowy."

The important point, then, is how to hit the happy medium so as to produce a fairly brilliant print, which shall at the same time be soft and full of half-tints. The careful and observant operator will often have remarked that a negative when simply developed with iron, is most exquisitely full of detail and half-tint; and also that when the required density is obtained for printing purposes, that much of this beauty is lost. The problem set for us, is to show how density or printing power is to be obtained, without losing any of the delicacy of the simply developed negative.

The first remark we should make is to the effect that far less density is required for printing purposes than is usually supposed. In the early days of photography it used often to be said, "That was a splendid negative; the sky was as black as your hat." In fact, the more intense the negative, the better it was considered. Happily the days of white "skies" and faces are now past, and we and the public look for something more like nature than either of these.

How, then, should we intensify our negatives? We may do so in either of two ways; firstly, by increasing the thickness of the deposit already formed by the iron developer; and, secondly, by altering the color of it, and so rendering it more non-actinic. It is usual to intensify at once after development, with either pyrogallic acid or iron and silver. In both cases the increased density is due to an additional deposit upon the lights of the picture. Unless very carefully done, there is a great tendency in both these methods to clot up and obscure the most delicate details of the negative. But the process is easy, rapid, and, if carefully used, effective, when the negative is properly exposed. If the exposure be a little short, this will mostly be found the best plan of working, but should it be found that the development is rapid, and the image thin and weak, it will be best to fix the negative before proceeding with the intensification. In photographing a sitter with a light dress or lace, or any subject with much delicate detail, this will also be found the most successful mode of operating, because it seems to give a more non-actinic color to the negative, with a thinner deposit than if the negative is intensified before the iodide is removed by fixing. Perhaps, upon the whole, these are the two best processes for the purpose, as the operations are well under control, and certain as well as rapid.

Negatives may also be intensified after fixing and drying by pyrogallic acid and silver. This process will give great brilliancy and delicacy, but it is not so safe as when the negative is wet.

There are many ways of intensifying negatives by means of changing the color of the deposit, but the only one which has come into general use, is that with bichloride of mercury and iodide of potassium. If a negative be fixed and dried, and a solution of the bichloride be washed over the surface, the image becomes of a darker color, but does not gain much in intensity. A solution of iodide of potassium, however, changes the color to a sort of olive-green, which is of great non-actinic power and gives great printing density. Where the negative is tolerably dense, and does not require any "dodging" to bring up any particular part, this is a capital process, but it should be remembered that the intensification is equal, and cannot be localized to any extent. For instance, should one hand of the sitter be too dark, in the first process, a pouring of the pyrogallic and silver on the part will increase the density in that part; while in the latter case, very little indeed can be gained in that way. It should also be remembered that there is great danger of over-intensity, and consequent hardness; and it is said that negatives thus treated become much more dense on exposure to light.

All processes in which the intensification is effected after fixing give brilliant negatives, while general softness and harmony is the characteristic of those produced by the methods first mentioned. These are only broad principles, and must be left for each operator to work out for himself. There is a method of adding slightly to the intensity of negatives, which we have used when only a very slight increase has been needed, and which we found occasionally useful. It consists in adding a small portion of coloring matter to the varnish used for the negative. We used the gum or resin known as "dragon's blood." A portion of this dissolved in the varnish gives the negative a rich brown tone; but it is doubtful if much is gained thereby, and it will rarely be required.

Having thus passed in review the processes of intensification, it may not be out of place if we offer a few remarks on the subject as a whole.

When a negative properly exposed is developed, and all the details are properly rendered, we have a picture in which there is a complete scale of light and shade. That it is too feeble to print does not affect this principle. But, as soon as we begin to intensify this, we increase the amount of the lights, leaving the darks of the picture unaltered. We thus entirely alter the scale of light and shade, and often make what would have been a quiet, harmonious negative, a harsh and discordant one. One of our great defects is that we treat all faces and subjects alike. If the face is finely moulded and will bear being brought into high relief, we can well bring it up into strong light; but it would often be better to keep it in low half-tint. This is now being done much more frequently than heretofore, and we can only hope that the practice may be extended to our ordinary work.

From what little we have said, it will be seen that much depends upon this part of the photographic process, and we hope that it will be worked out more fully by others, remembering that intensifying the negative not only affects the printing process as a process, but the print as an artistic production.

With these few remarks we close this short series on Dark-room "Dodges," and in so doing venture to hope that some, at least, of our readers will have found our hints worth thinking of, and useful in their daily practice.—*Illustrated Photographer.*

DEVELOPING AND TONING COLLODION PRINTS.

BY J. M. BURGESS.

I HAVE been asked, by various correspondents, to give a few hints as to the production of these positives, but have very little to add to what has been already published. No better formula for a developer can, in my experience, be used than the pyrogallic acid solution I have frequently given. It stands as follows:

Acetic acid,	12 to 20 minims.
Pyrogallic acid,	3 grains.
Citric acid,	3 grains.
Water,	1 ounce.

The exposure is about ten times as long as that required by an iron developer, and all the detail should come out before any intensity is gained. It requires a large amount of practice to stop it just at the right moment. As a rule, if the exposure is found to be long, and the picture comes out rather quick, you may let it grow dark, as it will lighten in the fixing and toning; but if the picture comes out very slowly, stop it as soon as it has become as dark as you wish it when finished. What is lost in the fixing will be gained in the toning. I always employ gold for toning, for though I have tried everything else, I could find nothing which has ever given me such a fine black tone. I use the strong solution, which has before been described, namely, 1 grain of double chloride of gold and sodium in a drachm of water. Its action is very rapid, the toning being effected by pouring the solution on the plate like a developer. When properly managed, the tone is a rich neutral black.—*The Photographic News.*

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FIXING NEGATIVES WITH HYPOSULPHITE.

BY RUSSELL SEDGFIELD.

I THINK that I can satisfy your correspondent, Mr. Hele, with respect to the safety of negatives fixed with hypo. I have had a pretty large experience with it, under all sorts of circumstances, at home and on journeys, and have no doubt whatever of its perfect safety, if only reasonable care be taken in washing the plate. And here it is that the error lies. It seems to be thought that a large quantity of water is required, and that if a gallon or two be poured over a stereo plate, it is sufficient. But I think it is soaking that does the job.

Let me describe my ordinary practice when from home and water is not too plentiful. I first flush the plate with a few *goes* of water, rocking it a little, and also wash the back. This removes all the surface hypo. It then goes into a flat ebonite dish of water, where it remains till the next is ready, or during the packing of the apparatus, and then receives a final flush or two of fresh water. This dish does not require renewal with every plate. There seems very little hypo to soak out, but it is just that little that does the mischief. The recent fire on my premises has led to a grand rummaging out of old negatives, and I can say that although I am not such an ass as never to have a failure (for I've had plenty, and trust, rather than hope, to meet many more), my plates are, at any rate, free from the hypo disease, whether in the shape of crystals, fine hair-like cracks, or honeycomb risings of the film, with all of which, and a great many other queer phenomena, a photographic printer is pretty sure to make acquaintance.

And here let me warn your readers against stopping-out skies or any large spaces with water-colors, and particularly moist colors. Such treatment is almost certain to spoil the negative. The effect may not be manifest for years, but some warm day, on looking out the negative and putting it to print, it will be found that the whole of the painted parts chip and peel off, exposing the bare glass. The cause is in the hygroscopic vehicle used—gum, for instance, which expands and contracts very considerably, according as the weather is damp or dry, and gradually loosens the adhesion of the film. I have not noticed that gamboge behaves in this way, though I never use it myself. Indeed it is a mystery to me how it is that photographers seem to think that any shade of yellow must be more opaque than black. I find "Bates's Black" perfectly safe, and no doubt other varnishes of the same character are so likewise.—*The Photographic News.*

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ON RETOUCHING THE NEGATIVE.

BY JOHANNES GRASSHOFF.

MANY complaints which I receive bearing upon the subject of retouching negatives are based upon the unequal manner in which the varnished surface receives the graphite rubbed from the pencil; sometimes a large quantity of the black-lead adheres to the negative during the operation, and sometimes but a slight trace of the material attaches itself. Much depends upon the degree of hardness of the pencil selected. I always employ the best (manufactured by Faber), of Siberian graphite, using four degrees of hardness, from Nos. 1 to 4, according as the varnish film is soft, or hard and dry. Thus immediately, after varnishing, No. 1 pencil is generally the must suitable; after four or six hours, No. 2. If a day has elapsed, I generally use No. 8; but, under certain circumstances, No. 4.

My experiments, conducted with a view of rendering the varnish more ready to take up the blacklead, have guided me to a peculiar method of manipulating which I will here describe. I obtain some *ossa sepia* (which may be purchased in sticks, at a very reasonable cost, at any druggist's), and scrape off a small quantity by means of the finger-nail, sprinkling the same over such portion of the negative (I am talking here of portrait negatives) requiring to be retouched. This very finely-divided powder is now rubbed over the surface—as, for instance, the head of the portrait—with the finger until a sufficiently matt surface has been produced, and upon this the pencil may be worked very effectually in the usual manner. When held against an intense light and viewed as a transparency, fine hair-lines are visible upon this part of the negative, but these are not seen in the least degree during printing. For some considerable time I have employed this mode of proceeding, and can, therefore, safely recommend it, more especially as the shadows in the face are by its means rendered more delicate, a very welcome and important consideration in the manipulation of lady portraits.

The practice of treating the varnish with oil of turpentine immediately before retouching, in order to facilitate the employment of the pencil, is a very good mode of proceeding, but possesses the disadvantage that the application of Indian ink to which gum has been added, in order to give greater opacity and body, is rendered impossible.

Negatives likely to be much used—as, for instance, stereoscopic views, portraits, etc.—is very essential, and should be preserved, as much as possible, from all external risk of injury. To effect this, it is well to coat the negative in the first place with thin amber varnish, as Bedford recommended some time since, taking 1 part of ordinary amber varnish (the finer qualities of amber varnish dry too slowly, on account of the large quantity of oil they contain) and 8 to 10 parts of oil of turpentine, and filtering the mixture carefully before use. Let the negative treated with this varnish stand till the next day in a locality sheltered from dust, and then manipulate very carefully with an exceedingly soft pencil. After drying thoroughly, the surface will receive water-colors with the same readiness as the blacklead.

When the retouching upon the amber varnish has been completed, the negative is varnished in the ordinary manner, the plate being slightly warmed previously to the operation; further retouching can afterwards be effected if necessary.

The method of coating unvarnished plates with a solution of gum or gelatine, and then retouching them, I have practised for a considerable period, but have found that negatives of this description, when subjected to extremes of temperature or to the influence of damp, do not exhibit those permanent qualities which a valuable negative should possess; amber varnish used in the manner described forms a much more permanent protection.—*Photographische Mittheilungen.*

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ARTISTIC EFFECTS IN PHOTOGRAPHIC PORTRAITS.

It is now almost twelve months since Mr. Rejlander, at a meeting of the South London Photographic Society, introduced a subject for discussion—this method having been found, on the whole, to give rise to a freer and fuller discussion among that body of practical men than when the more formal one of reading a paper was resorted to.

In the course of his observations, Mr. Rejlander laid it down as a condition in the finest portrait negative, that it must have only the *very* deepest portions of the shadows represented by clear glass and only the *very* highest lights opaque, and that, further, these portions of the picture should be limited in extent. In the former case power was conferred upon the negative to the same extent as in the latter. The parts in a photograph, therefore, which must be perfectly white must be few in number.

At the last meeting of the same Society, Mr. Cocking, the Honorary Secretary, exhibited some prints which, although not embodying any startling or scientific novelty, were yet highly suggestive to artistic photographers. The portraits alluded to were soft and delicate, but the middle tones, in which they abounded, so to speak, were rendered so perfectly as to emphasise any encroachments on the domain of tint; that is to say, many portions would have been considered as belonging to the highest or lightest tones had there been no standard of comparison belonging to a still higher school.

The means by which these effects were obtained, were found to be, when explained by Mr. Cocking, very simple in the abtract, although they might not have suggested themselves to every person, even after a careful inspection of the pictures.

Let us, then, suppose that a portrait has been printed in which, from the constitution of the negative, or from under-printing, there is a large amount of pure high light. The object now is to slightly lower this mass of light, and to introduce something still higher—something which, by comparison, will cause it to assume a much lower place in the scale of tones. We will now direct attention to Mr. Cocking's mode of procedure.

He first prints the portrait in the usual way, leaving large masses of pure light, or, at any rate, tones, which, if toned and fixed at this stage, would represent white when finished. On removing the print from the pressure-frame he fits carefully over it a plate of glass of the same size, on which he has made sundry opaque marks—spots or streaks, as the case may be—by means of any opaque body, such as water color, oil color, or varnishes. The exact spot where this opaque body has to be applied, is ascertained by interposing the plate of glass between the negative and the eye, a strong source of illumination being behind both, and touching out here and there those points and spots where the highest light is wanted, such as on the eye, the ridge or tip of the nose, the shirt, breast, etc.

When a glass is thus prepared it is placed over the printed and still sensitive photograph now removed from the pressure-frame; and, the greatest care having been taken to secure perfect registration, the picture is exposed to the light for a sufficient time to allow a decided tint to be printed all over, except of course in those parts covered by the opaque touches on the plate of glass. The effect of this second exposure is that the whole of the picture previously printed is lowered in tone, with the exception of the touches referred to.

Some parts—as, for example, a touch of light on the eye—should be sharp and well-defined; others may be softer and vignetted, so to speak, in the surrounding semitone. The former is obtained only by the opaque stopping being effected on that side of the glass placed next to the print. Softness of outline, on the contrary, will be obtained by working on the side of the glass farthest removed from the paper.

Photographers are usually so extremely fertile in resources that we feel assured they only require the *hint* in what direction, and by what means, they may secure superior effects to stimulate them to follow the track thus indicated until it leads them to the desired goal.

But it must be specially borne in mind, that the power indicated above is one which must never be attempted to be controlled except by a photographer of thoroughly artistic feeling. In the hands of any other it will only help to degrade photographic art, and make it the jest of persons of refined taste. Let Mr. Cocking's excellent suggestions be wisely acted upon.—*British Journal of Photography*,

ON PINHOLES.

BY B. W. KILBURN.

WE have read a great deal of complaint in the Journals about pinholes, their causes and their remedies. I never experienced any trouble from them until during the past summer, but what I could easily trace to the cause, and then the remedy was easy.

Last July, however, I attempted some work with a bath which I knew was in fine condition, having seen but little service. I was surprised, therefore, to see my negatives covered with minute pinholes hardly perceptible to the naked eye. I gave it a thorough filtering and tried it again. Lo! the pinholes were still there, thicker if possible than before.

I then took a new bath, which worked well for a short time, then began to cause pinholes like the first, and soon became useless. Such unusual behavior surprised me, but I soon traced the cause to neglecting to wrap the bottle in thick paper while filtering the bath into it, though exposed only to a mild light almost too weak to read by.

From this experience I find that it is best to keep a bath when you once begin to work it, as much as possible in the dark, until it needs sunning, and then sun it thoroughly. Neglecting to do so, is often the cause of pinholes I think, when it is attributed to other causes.

BITS OF INFORMATION.

TO REDUCE OVER-PRINTED PROOFS.

PLACE them in a weak solution of cyanide of potassium. A better way is said to consist in immersing them in a strong and hot solution of hyposulphite of soda, allowing them to remain in it for five minutes, afterwards transferring them to the ordinary fixing bath.

TO REMOVE SILVER STAINS.

The following mixture will remove all silver stains. Mix together and keep in a bottle:

Alcohol,	20 parts.
Iodine,	1 part.
Nitric acid,	1 "
Hydrochloric acid,	1 "

Apply this to the stain, and after a few minutes apply either a solution of hyposulphite of soda or of cyanide of potassium—the latter to be preferred. A second application is sometimes necessary. After the stain disappears wash well.

INTENSIFICATION OF VARNISHED NEGATIVES.

To intensify a weak negative that has been varnished, place it in a bath of alcohol and apply heat. When warm remove it, and pour over it some tincture of iodine, well diluted with alcohol. By these means the deposit of silver will receive more actinic density. There are several other methods, but this is simple and often very effective.

INTENSIFYING SOLUTION.

A	Pyrogallic acid,	3 grains.
	Water,	1 ounce.
B	Nitrate of silver,	10 grains.
	Citric acid,	20 "
	Acetid acid,	1 drachm.
	Water,	1 ounce.

For use, mix a few drops of B with enough of A to cover the surface of the plate.

PLATE-CLEANING SOLUTION.

A.—	Bichromate of potash,	1 ounce.
	Sulphuric acid,	1 "
	Water,	1 pint.

Let the plates be immersed in the above, which removes stains, grease, and other impurities.

B.—Nitric acid and water is useful for cleaning plates.

C.—Old worthless collodion is very useful for the same purpose.

D.—If the plates are old and have been varnished, immerse them in boiling water containing some common washing soda, when the film will be removed in a few seconds.

TO ENAMEL PAPER PHOTOGRAPHS.

Coat a plate of glass with tough, plain collodion, and, when dry, give it a coating of gelatine previously dissolved and clarified. To prepare this, let an ounce of gelatine be soaked in twelve ounces of cold water for a few hours, and afterwards apply heat until it boils. The white of egg should be stirred up with it when the gelatine is dissolved, but before it boils. When filtered the solution is bright and clear. The coating on the glass should be allowed to become quite dry, and glasses so coated may be kept ready for use. To apply the film let the picture, previously gelatined and dried until it be tacky, be laid down upon the prepared surface of the glass, which just previously must be made wet. Press the two in close contact, taking special care that no air-bubbles be allowed to intervene. After drying, which may take from one to several hours, the picture may be removed from the glass.

POLISH FOR MAHOGANY CAMERAS.

Take three ounces of white wax, half-an-ounce of Castile soap, and one gill of turpentine. Shave the wax and soap very fine, and put the wax to the turpentine; let it stand twenty-four hours; then boil the soap in one gill of water, and add it to the wax and turpentine.

LIQUID GLUE.

A strong liquid glue for repairing broken vessels, cementing glass, etc., is made, according to M. Knaff, by taking three parts of glue in small pieces, and placing them in eight parts of water for some hours, when half-a-part of hydrochloric acid and three-quarters of a part of sulphate of zinc are added, and the whole kept at a moderately high temperature for ten or twelve hours. The glue thus treated retains its liquid condition, and will not become gelatinous again.

COVERING FOR TENTS.

The best and lightest material for covering a tent is a thin India rubber-coated fabric, sold by all dealers in India rubber. It is very light, and is quite impervious to both rain and light. Black twilled calico, coated with boiled linseed oil, will form a rain-tight cover. Cloth may be rendered water-proof in a variety of other ways; for example, brushing it over on the wrong side with a solution of gelatine, followed, when dry, by an application of an infusion of nut galls. If one is not afraid of an unpleasant smell (of short duration), make a varnish of India rubber dissolved in bisulphide of carbon, and apply it to the cloth.

CHEMICAL EQUIVALENTS.

The following will convey to a young photographer or a curious reader an idea of chemical equivalents, or combining proportions. It has been found, by accurate experiment, that, when oxygen and hydrogen combine, they do so in the proportion of eight of the former to one of the latter; hence the chemical equivalent of hydrogen is 1; that of oxygen 8; sulphur 16; silver 108, etc. These numbers indicate the proportions in which the elementary bodies combine with each other. Stöckhard's illustration is one of the simplest that can be adopted:—For the same sum can be purchased six ounces of gold, or 12 ounces of platinum, or 100 ounces of silver, or 1,500 ounces of mercury; consequently six ounces of gold have the same mercantile value as twelve ounces of platinum, or 100 ounces of silver, etc. The same principle holds good in chemistry. Twenty-eight ounces of iron, forty ounces of potassium, or 200 ounces of mercury, combine with eight ounces of oxygen; accordingly twenty-eight ounces of iron have the same *chemical value* as forty ounces of potassium, or 200 ounces of mercury. By one equivalent—from *æquus* (equal), and *valor* (value)—of oxygen is to be understood eight parts of it *by weight*, and the same with the other elementary bodies.

INTENSIFYING SOLUTIONS.

Almost all the organic iron solutions recommended for developing answer well for intensifying, with the addition of a few drops of a fresh silver solution.

When an ordinary iron developer is used, it can be employed for intensifying; also, if, instead of a few drops of plain silver solution, citro-silver solution (20 grains of nitrate of silver, 30 grains of citric acid, and 1 ounce of distilled water) be added. This plan saves trouble, and the plate need not be washed before intensifying.

FIXING SILVER PRINTS.

The fixing solution should consist of 4 ounces of hyposulphite of soda, and 1 ounce of carbonate of ammonia in a pint of water, and should always be used fresh. The number of prints of a given size, which may be safely fixed in a definite quantity of hypo solution cannot be absolutely stated. Theoretically, about three parts of hyposulphite of soda will be required to dissolve one of chloride of silver. One whole sheet of sensitive paper has been calculated to contain about from 25 to 30 grains of chloride of silver. On this theory about half a dozen sheets of paper might be fixed by one ounce of hyposulphite of soda. In practice, however, so many other circumstances interfere, that perhaps not more than one-fourth of that number ought to be fixed in the quantity. In very cold weather it is well to raise the temperature of the solution to about 60° Fahr. Great care should be used to remove small air-bubbles, which issue in minute yellow spots of imperfect fixation, often attributed to defects in the paper. Perfect washing is, of course, imperatively necessary. No new method of effecting this has been introduced.

NEW METHOD OF INTENSIFYING—YELLOW NEGATIVES.

Mr. Wharton Simpson has introduced a new method of intensifying negatives, of extreme simplicity and efficiency, preserving delicacy whilst adding materially to the printing value of the image.

It consists in treating the fixed and washed negative with a solution of permanganate of potash, by which its color is changed from the dusky gray, common to an iron developed negative, to a tint of a brownish yellow or olive by reflected light, and orange by transmitted light. Great increase in the adiactinic character of the deposit is produced, so that, with a comparatively thin and delicate negative, great vigor is obtained in the prints.

The permanganate of potash, on coming into contact with the silver image, is decomposed and parts with oxygen, which combines with the silver; at the same time binoxide of manganese is precipitated upon the image.

The best mode of proceeding, is to place the fixed and washed negative in a dish containing a dilute solution of the permanganate, say ten grains or less to an ounce of water. The change is complete when the tint becomes as apparent at the back of the glass as at the front. The permanency of such negatives is necessarily a question of time; but, reasoning from analogy, we have no reason to doubt it, as binoxide of manganese is one of the most stable bodies with which we are familiar,

A transparency treated in this way, and then burnt in a muffle, would probably give a fine enamel picture, as oxide of manganese gives a fine vitreous black.

UNEVEN DRYING OF SENSITIZED ALBUMENIZED PAPER.

The following is given by a correspondent of the *Photographic News*, as an excellent method of preventing the silver solution draining and drying unevenly on albumenized paper:

"Beat up the white of an egg *well* in 4 ounces of distilled water; add to this 4 ounces of the ordinary silver printing solution; allow this to settle, and, rejecting the sediment, add a portion of the solution to the paper sensitizing bath. If the *blisters* still continue to appear, add more of the solution till the evil is eradicated.

"The strength of my sensitizing bath is now only 50 grains to the ounce, and I secure as rich and vigorous prints as if I were using a 90-grain solution.

"My toning bath is the old acetate of soda one:

Acetate of soda,	30 grains.
Chloride of gold,	1 grain.
Distilled water,	8 ounces.

Mix the soda and gold in an ounce of the water, and let it stand for half-an hour; add the rest of the water, and tone."

TO PREVENT BLISTERS IN ALBUMENIZED PAPER.

A correspondent of the *Photographic News*, signing "Vesicula," says: "Certain conditions are required to produce blisters; viz., a thick, dry, horny film of albumen, and either a weak solution of silver, or a short time of floating; just as you avoid these, you avoid blisters. The remedy is, thoroughly coagulate the albumen on the paper; then try your best, and you cannot produce blistered prints. The same is true of albumen films in dry plates."

SUBSTITUTE FOR GROUND-GLASS.

Mr. Woodbury proposes to use gelatine rendered semi-opaque by the addition of a white pigment. White pigmented gelatine gives an effect scarcely distinguishable in kind from opal glass, but as it can be used in a much thinner and more transparent layer, the softened delicate effect can be obtained without dullness;

in fact, the degree of opacity is quite under the control of the photographer himself. Either for transparencies or for focussing-screens it answers well.

For preparing sheets of opalized gelatine, the formula stands as follows:

French clear gelatine,	5	ounces.
Water,	20	"
Glycerine,	½	"
Oxide of zinc,	1	"

After soaking the gelatine in the water for a few hours it is dissolved by gentle heat, and then filtered through flannel. The zinc white is placed in a mortar with the glycerine and one ounce of water, and made into a soft paste. It is then stirred into the warm gelatine, and allowed to stand for a couple of hours, keeping the solution warm to allow the coarser particles to settle to the bottom; the upper portion is then carefully decanted to get rid of the sediment, or, if it be allowed to cool and become a jelly, a slice can be cut off the bottom, removing all the coarse particles. Where the photographer desires to make the sheets for use, it will be wise to use up his solution at once, as it will not keep well, especially in hot weather.

TEMPORARY VARNISH FOR NEGATIVES.

Many negatives only require to be used once or twice. In order to protect them, they may be coated with a temporary varnish, made thus: Take 4 ounces of white glue and dissolve it in 4 ounces of acetic acid, add a pint of water, and when properly mixed, it is ready for use. Coat the plate as with collodion. It is easily washed off, and saves much time and trouble.

BLACK VARNISH.

An aniline black varnish, of recent Parisian production, is the following: In a litre of alcohol, 12 grammes of aniline blue, 3 grammes of fuchsine, and 8 grammes of naphthaline yellow are dissolved. The whole is dissolved by agitation in less than twelve hours. One application renders an object ebony black. The varnish can be filtered, and will never deposit afterwards.

FINISHING PRINTS.

The following method for treating photographic prints is recommended by a correspondent of the *Archiv:* "A piece of plate-glass is heated, and, while yet warm, a little wax is rubbed over by means of a piece of cotton-wool; water is then poured over the plate, and the moistened picture laid thereon and pressed closely down by means of a piece of filtering-paper. When dry, the picture is removed, and will be found to possess a surface of the greatest brilliancy, which is not injured by the process of mounting.

ANTIDOTE FOR CYANIDE.

The injurious effect on the skin produced by cyanide of potassium in electro-plating establishments is completely arrested, and ulcerous sores prevented, by anointing the hands with a mixture made by incorporating protosulphate of iron in fine powder with linseed oil.

A VALUABLE TONING BATH.

The following is said to give very fine results: 3 grains chloride of gold, 20 grains chloride of calcium, about half a teaspoonful of powdered chalk, 20 ounces common water. It must be mixed twenty-four hours before use, or, with boiling water, one hour will be sufficient. It never refuses to tone, and will keep; and more gold, chalk, and calcium, may be added to it; but it is as well to make it fresh after renewing it two or three times. Mealy prints are never produced by it.

ADAM SALOMON'S DEVELOPER.

M. Adam Salomon's usual formula for developing is as follows:

Ammonia sulphate of iron,	75 grains.
Glacial acetic acid,	75 minims.
Sulphate of copper,	7 grains.
Water,	3 ounces.

TO STRENGTHEN VARNISHED NEGATIVES.

Mr. C. T. Winter says a varnished negative that needs strengthening is to be treated slightly with weak spirits of wine, but not absolute alcohol, for that dissolves the film, as does also the impure methylated spirit. When dry, the surface will be dull, and the intensity of the negative much increased.

ON USING OLD COLLODIONS.

Do not immerse plates in your silver bath, coated with old decomposed collodions. Free iodine and bromine always make the bath more acid by the liberation of the nitric acid from the nitrate. Moreover, decomposed collodion, whatever may have been its original character, has invariably strong organic affinities for nitrate of silver, and would contaminate it with organic impurities.

PRINTING DODGE.

In pictures by the best portrait-painters, we find a concentration of light on those portions of the subject which best claim our attention; this may be imitated by exposing to the sun for a few seconds the print before fixing, having laid a piece of cotton wool, or a dark-centered vignette plate over the face, in the former case the wool should be kept in motion.

TO IMPROVE DETERIORATED PRINTING BATHS.

Dissolve a drachm of permanganate in four ounces of water, and keep in a glass-stoppered vial. The bath to be cleared is to be rendered neutral or slightly alkaline, and then, to each pint of 60 or 70-grain solution, about five drops of permanganate solution is to be added, or, at any rate, enough to give a faint permanent rose color. Shake well up, let stand for a quarter of an hour, and pass through a well moistened filter. If any color remains, return through the filter.

TO PREVENT STOPPERS STICKING.

To prevent stoppers sticking in bottles that contain caustic solution—lubricate them with paraffin.

CADMIUM COLLODION.

Cadmium collodion is useful for badly-lighted subjects, or in the dull weather of the winter season; but in a glare of sunshine it is liable to solarize and produce red pictures.

NEGATIVES SUITABLE FOR ENLARGING.

The negative suitable for yielding an enlarged print in a copying camera must be exceedingly thin; it must not be nearly so dense as a common negative for printing by contact. All negatives for development printing should be thin, but those should be especially so which are intended for use in a copying camera. Something about half-way between a collodion positive and a negative is the right thing. The reason why camera prints and solar-camera enlargements are so often hard, and deficient in the delicate shades of the high lights, is because, generally speaking, the negatives are much too dense; one-half the usual density would be quite sufficient.

MANY MITES FROM MANY MINDS.

BY EDWARD L. WILSON.

WHEN you are troubled with surface markings add a little fine powdered white sugar to the bath. It will end the annoyance. A few drops of alcohol will answer the same as the sugar sometimes, if added carefully.

The same plain solution of pyrogallic acid may be used for developing several negatives.

When "dipper marks" appear on your plates, dilute your collodion with—say one ounce to five of—plain collodion.

A small piece of camphor wrapped in a bit of clean paper and put with your protosulphate of iron will prevent oxidation of the iron.

When you are short of time don't waste it by tampering with an obstreperous bath. Throw it down and send it to the refiner and then make up a new one. It will save your money.

A bath not saturated with iodide of silver will produce unequal results.

An old and impure bath; a weak bath and a very new collodion, cause fog.

As soon as the plate is free from oiliness remove it from the bath.

Dirty plates will create metallic silver stains under the film and cause the film to break up during varnishing.

Pyrogallic acid will not keep in solution in water. Use alcohol instead of water and dilute when used with water.

To get splashes on your negatives shut down the slide suddenly.

The very fine crystals that sometimes form in the bath may be eradicated by rendering the bath slightly alkaline and sunning it.

If the hypo fixing solution is weak or old your prints will be either grayish yellow or have a brown mottled look.

Too much time between the exciting and developing of the plate will cause matt silver stains upon the negative. So will a horny repellent collodion.

When using a weak silvering solution for your paper you should systematically keep it up to the standard strength or the albumen from your paper will be dissolved.

Have a care that fingers with hypo on them do not touch your prints before they are fixed.

It is a bad thing to add collodion to a bath for the purpose of iodizing it. It adds ether and alcohol to the bath which cause many evils.

If your bath shows tendency to fog, and you cannot at once correct it, dip your plates less time.

Never use acetic acid in your bath. Nitric is best.

An earnest effort to produce good work will succeed, when accompanied by a desire to excel.

Not only have good tools to work with but cultivate good taste in using them.

The production of a photograph depends upon the use of the right formula in the right place. So does its excellence depend upon the care, cleanliness and taste of the manipulator.

Dust is an evil spirit, haunting us on all sides. Be not too familiar with it, but resist it and it will flee from you.

The developer should be applied with a full sweep, and as little as possible allowed to go over the edge of the plates, because it carries with it the silver which is needed to build up the image.

If the plate has been properly exposed the image will come out gradually, but quickly if under exposed.

Good time on the negative and a weak developer is much better than the reverse.

If you hold the plate still and allow the developer to remain quiet, development will go on as far as you want it, but if you move the plate about and pour the developer on and off, the image piles up quickly without penetrating duly into the shadows.

Those who have hot, moist hands should use whiting and alcohol to clean their plates, for marks on a plate from such hands make the film very apt to slip off.

It is most important to keep up the strength of the bath from day to day.

Each plate immersed not only robs the bath of silver but leaves behind grosser materials to alter its composition.

Always have two or three or four baths prepared and use them alternately.

A ten grain developer is much better than a twenty grain one for nice detail, such as lace drapery, etc.

When extreme contrast is needed, a collodion containing very little bromide should be used and be careful to avoid over exposure.

Be very sure to wash your negatives well after fixing before you intensify, especially if you use pyro and silver.

A thick collodion requires a stronger bath than a weak one.

See that your collodion and bath harmonize with each other.

For weak negatives silver strong and print in the shade.

Dense negatives print in strong diffused light on paper rather lightly silvered

It is a good plan to keep a piece of albumen paper in the printing frame always next to the sensitized sheet, both in cold and hot weather. It often prevents cockling.

Red, mealy spots and imperfect fixations are often caused by perspiring hands.

In toning keep the weak prints until last and avoid forcing them into the black stage. Observe.

Never use a fixing solution twice. It is dirty.

For subjects having violent contrasts and for instantaneous collodion, a large proportion of bromide may be used to secure softness and harmony. The tendency of bromide is to decrease contrasts and secure detail.

If the image lacks vigor a grain or two more cotton in the collodion will make it better.

In winter use a stronger bath; a more highly bromized collodion and a stronger developer than you do in summer.

Don't work a highly bromized collodion with a weak bath.

The faculty of keeping his materials absolutely apart from each other is a blessing to the photographer who possesses it.

I have known the work of four printers for a whole bright day to be spoiled in an instant by dirty fingers being put in the water when the prints were washing.

Every day employ your spare moments in securing cleanliness about you. Filter your bath, wipe the mouth of your collodion vials; clean your holders dry; wash your funnels, bottles and tanks, and with a damp cloth wipe up all the dust and dirt.

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G. An elegant Portrait from an Italian negative by the Woodbury process; the Gold Medal composition Prize Picture; Portrait from negatives by Adam Salomon, Paris; Shadow Picture, by W. J. Baker; Rembrandt Effect, by William Kurtz; An example from a retouched negative, with one of same subject from a negative not retouched, by J. F. Ryder; a splendid German Life Study, by Loescher & Petsch; &c., &c. All the above are now engaged, and several of them ready, for the succeeding numbers of the volume for 1870.

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MOUNTFORT'S

CRYSTAL VARNISH.

It Dries WITHOUT HEAT, VERY QUICKLY, and VERY HARD.

Warranted not to STICK, CRACK, or PEEL. May be used for FERROTYPES, AMBROTYPES, or NEGATIVES.

Now used exclusively by the most eminent Photographers in this country. It contains ingredients never before used in Varnishes, and possesses the following merits over every other brand:

This Varnish dries in a few seconds *without heat* almost as hard as glass.

It is perfectly transparent, and does not diminish the intensity of the negatives.

Negatives can be printed from, in a few seconds after having been varnished.

☞ ***It will not adhere to the paper or become soft in printing.***

It never chills if the plate is dry. It is equally good for positives or negatives.

It gives a beautiful gloss and brilliancy to Ambrotypes and Melaineotypes, and will not crack or peel. It is used without heat, thereby saving the cost of burning alcohol.

☞ **GET A BOTTLE AND TRY IT.** ☜

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Ask for MOUNTFORT'S CRYSTAL VARNISH, and do not take it unless my *signature* is upon the label. Imitators dare not counterfeit that. They have imitated my bottle as near as they dare. They have also copied the label as close as they dare. All that keeps them from counterfeiting my name is, they are afraid of the law.

All my Crystal Varnish is put up in bottles with my name blown in them, and my signature is upon every label. TAKE NONE OTHER.

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None genuine unless signed by

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CELEBRATED

Albumenized Paper.

WILLY WALLACH,

No. 43 John Street, New York,

GENERAL AGENT FOR THE UNITED STATES.

The following most popular qualities are always kept in stock:

8 K. Rives, White, Pink, & Blue.

10 K. Thick Rives.

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8½ K. Steinbach's Saxe.

PRICE PER QUIRE, $2.50

FOR ALL THE DIFFERENT KINDS.

Samples, and prices by the ream, will be furnished on application, by the General Agent.

For testimonials, refer to the *Philadelphia Photographer.*

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ESPECIAL MANUFACTURERS OF

Mounts of every Description for Photography.

TRADE MARK CH. D.

ARTISTS' CABINET PORTRAIT MOUNTS, with large margin,
MOUNTS FOR CARTES DE VISITE,
CASES FOR HOLDING CARTES DE VISITE,
BOOK-POST (PATENT),
MOUNTS FOR MEDALLION PORTRAITS, a splendid assortment,
FRENCH BRISTOL CARDS of every strength and size,
FRENCH BRISTOL BOARDS, WITH INDIA TINT,
MOUNTS FOR STEREOSCOPIC VIEWS, &c.

MEDALS Awarded at every Exhibition.

We have received from Messrs. ROHAUT & HUTINET, a lot of sample books of Cards, Cases, &c., of their manufacture, which we propose to mail to parties who desire to order, on receipt of five dollars, as guarantee for their return.

These sample books are to be returned to us, free of expense, within two weeks, when the money advanced will be returned. They contain a choice selection of beautiful CARTES DE VISITE, CABINET, STEREOSCOPIC AND LARGER MOUNTS, CARTE AND CABINET CASES, &c., &c., in great variety. Those desiring to improve their work by using beautiful and tasteful MOUNTS, can now be accomodated.

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VOIGTLANDER & SON, AND DARLOT TUBES AND LENSES.

☞ *For full description of Lenses, send for* PRICE LIST.

The following are a few of the testimonials that we are in constant receipt of:

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From J. W. BLACK, *Boston*, Oct. 19, 1869.—"Having tried the No. 5 Extra 4-4 new Lens of Voigtlander & Son, I can most cheerfully say it is one of the best lense I evers used; it works very quick, and has good depth and fine field, and will be found a very valuable Lens for the Cabinet, Card, and other pictures."

From G. H. LOOMIS, *Boston*, March 30, 1869.—"GENTS: After several months trial, I desire to record my entire satisfaction with the No. 3 Voigtlander & Son Lens purchased of you, and in justice further to say, that, notwithstanding the somewhat extravagant claims put forth by manufacturers and agents of other instruments in this country and Europe, I find the Voigtlander & Son series the very best, and, therefore, the cheapest now before the public. I have tried several kinds of Lenses, and if it is possible that the one I have selected has an equal, it will give me pleasure to see through it."

From B. C. TAYLOR, *Warsaw, Ills.*, Nov. 16, 1868.—"I have tried the Gem Tubes, and they are all I could wish for in making good sharp pictures. I think they compare with the Voigtlander tubes for sharpness and defining the picture, and I believe them to be the best Gem Instruments made."

From J. M. MUNN, *Atchinson, Kansas*, July 8, 1869.—"Send me a No. 3 Voigtlander & Son Lens, I am satisfied they are the best instruments. A party here has one that is splendid; I offered him $150 for it, but could not get it. I have over $800 worth of Lenses of other makers and not a good one in the lot."

From A. D. WILES, *Tremont, Ohio*, Sept. 9, 1869.—"The No. 3 4-4 Voigtlander & Son Lens you sent me is perfectly satisfactory, it cannot be beat."

From GROSSKLAUS & RICKSECKER, *Navarre, Ohio*, Dec. 11, 1868.—"Our customer whom we furnished the No. 3 Voigtlander & Son Lens, is very much pleased with it, and would not exchange for any No. 3 B. Dallmeyer you or any one might offer him."

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Pictures Taken by Artificial Light

EQUAL TO SUN PICTURES!

GOOD PICTURES MADE WITH 3 CENTS WORTH OF LIGHT, AND 20 SECONDS TIME.

PROCTOR'S PATENT NIGHT PHOTO. INVENTION

Any artist can operate it without the slightest trouble. Artists are now realizing by the use of this invention, from $100 to $300 per month.

Price for Portable Room, complete, with license to use, $100.

Only half ($50) cash on delivery. Balance on easy terms.

☞ This invention is also applied to copying and enlarging Pictures which will prove a great convenience to Artists, as they can do their copying on dark, rainy days, and in the evening, actually better and quicker than by the most favorable sunlight, at a trifling expense, vary-from ¼ of a cent to 3 cents for light.

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PRICE, *$28.00.*

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THE STANDARD PICTURE MATS.

THE NEATEST FITTING

For Picture Frames,

ADOPTED FOR EVERY CLASS OF

PHOTOGRAPHS, CHROMOS, ENGRAVINGS,
LITHOGRAPHS, etc., etc.

These Mats are originaly designed and introduced by us, they are made of fine Bristol Board, embossed and handsomely lithographed, which gives them the appearance of a French Passepartout.

Some parties have tried to imitate these Mats, and we have therefore concluded to style them from this date, *The Standard Picture Mats,* with our Trade Mark the letters L. P. & Bro. in monogram on the labels.

November, 1869.

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MANUFACTURERS OF

Mats, Passepartouts and Show Displayers,

OF EVERY VARIETY,

FOR THE TRADE.

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Having eighteen direct printing Solar Cameras in operation, is prepared to execute all orders for Printing with neatness and despatch. Negatives for the purpose, sent either by mail or express, must be carefully packed, prepaid, and accompanied by the price of the work to be done. The prints will be *returned* by mail unmounted *free of expense.* The negatives will be carefully preserved, under lock and key, or returned if desired.

PRICE LIST.

30 x 40	Drawing Paper, . . .	$5.00	Canvas,	. .	$5.00
29 x 36	" " . . .	5.00	"	. .	5.00
25 x 30	" " . . .	3.00	"	. .	4.00
22 x 26	" " . . .	2.50	"	. .	3.00
20 x 24	" " . . .	2.50	"	. .	3.00
18 x 22	Albumen " . . .	2.50			
18 x 22	Saxe " . . .	2.00	Canvas,	. .	2.50
13 x 16	Albumen or Saxe Paper,	1.50	"	. .	2.00
11 x 14	" "	1.50	"	. .	1.50
4-4	" "	.75	The cost of canvas and stretcher extra.		

In the Canvas printing no albumen or gelatine is used, and the prints are in every respect equal to paper prints.

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8 x 10 Negatives, 75 cents. 4-4 Negatives, 50 cents.

WILL ALSO CONTINUE TO MANUFACTURE

NEGATIVE COLLODION AND VARNISH.

☞ Particulars furnished on application.

Knell's Patent Combined Chair and Lounge.

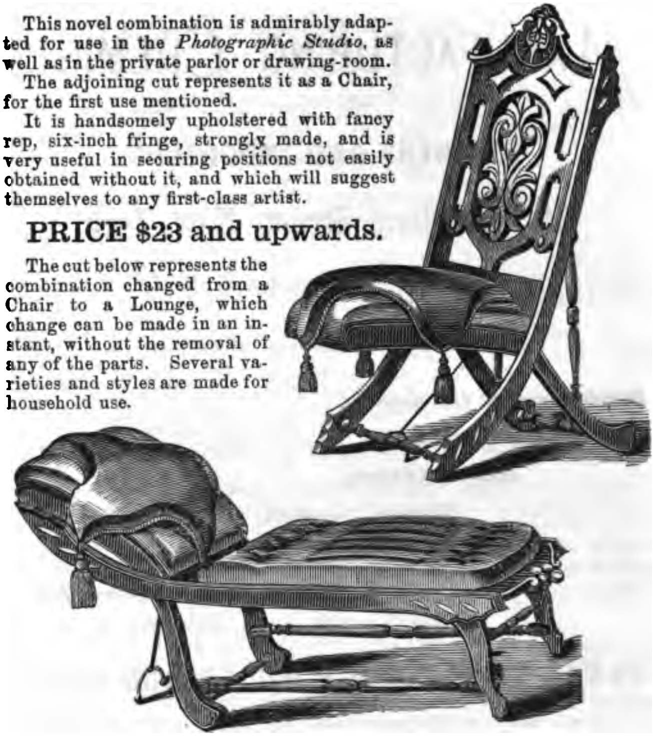
This novel combination is admirably adapted for use in the *Photographic Studio*, as well as in the private parlor or drawing-room.

The adjoining cut represents it as a Chair, for the first use mentioned.

It is handsomely upholstered with fancy rep, six-inch fringe, strongly made, and is very useful in securing positions not easily obtained without it, and which will suggest themselves to any first-class artist.

PRICE $23 and upwards.

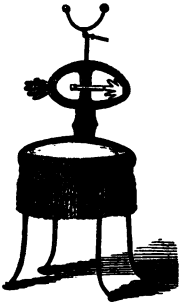
The cut below represents the combination changed from a Chair to a Lounge, which change can be made in an instant, without the removal of any of the parts. Several varieties and styles are made for household use.



Circulars describing the Patent Combined Chair and Lounge, for private use for the sick and invalid, sent on application.

PARLOR and OFFICE CHAIRS and LOUNGES.

Knell's Posing Chair for Infants (See Cut).



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REVOLVING, ROCKING, AND RECLINING CHAIRS,

VARIED STYLES.

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Patentee & Manufacturer of Photographic & other Furniture,

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Helion Cotton,
Helion Varnish,
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AT THE VERY LOWEST WHOLESALE PRICES.

Especial attention is invited to our new *Union Cotton* which we guarantee equal to the best or the money will be refunded. The Saving of Gold and Silver Wastes and Residues gains daily more Importance and we have thought it proper to make extensive Arrangements for Refining the same. Our charges are moderate, and to those who know us we need no further commendation.

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Give us a trial.

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STANDARD ARTICLE.—POPULARITY INCREASING.

See what Prof. John Towler says: "The surface of the paper is almost as structureless as glass. The albumen film does not blister in the toning and fixing, and it prints and tones with great ease and satisfaction; there is, too, a pearly whiteness of surface which is quite characteristic."

See what the editor of The Philadelphia Photographer says in speaking of Gurney's beautiful picture in the January number, 1868, page 31: "They (Gurney & Son), use the best of materials, employ the best workmen, &c., &c., and the prints are made on the celebrated Pearl Paper. Negatives by a 4-4 Harrison Lens and an American Optical Co's Box."

See what the editor of Humphrey's Journal (October 15, 1869), says: "Our picture in this number was made on Pearl Paper. This paper bears a high reputation and well deserves it."

See proceedings of American Photographic Society, held in New York, January 28, 1867, reported in the "Philadelphia Photographer," No 38, page 57. "Humphrey's Journal," February 1, page 295. A committee reported the Pearl Paper as giving the best results of any paper. See the following:

We take pleasure in recommending the Pearl Paper as being superior to any that we have heretofore used. J. Gurney & Son, Broadway, N. Y.; R. A. Lewis, Photographer and Manufacturer of the celebrated L. & H. Collodion, Chatham St. N. Y.; A. Jordan & Co. (successors to A. Bogardus), N. Y.; R. G. Barclow, Bowery, N. Y.; Geo. F. Pabst & Co., Bowery, N. Y.; Fred. Ulrich, Bowery, N. Y.; R. L. Wood, Broadway.

SEE THE FOLLOWING:

"We find the Pearl Paper decidedly the best we have ever used."—A. S. Wood, *Chatham Street;* A. S. Toplanyi, *M'fg Photographer, and Compiler of Gen. Sherman's Illustrated Cumberland Campaign.*

Brooklyn, March, 1868. "I have used over thirty reams of Pearl Paper during the past year and unhesitatingly pronounce it the best in the market."—Joseph Hall, *M'fg Photographer for the Trade.*

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Ask any *first-class operator* who has given the Pearl Paper a fair trial, the universal answer is, "IT IS THE BEST." All Stockdealers sell

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SCOVILL MANUFACTURING COMPANY,

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THE STEINHEIL LENS.

Celebrated for

WONDERFUL DEPTH,
WIDTH OF ANGLE,
UNPARALLELED CHEAPNESS,
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Fresh invoices monthly. Sent on trial by Express

1-4, $20. 4-4, $40. 11 x 14, $65.
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On account of Mr. Fennemore's peculiar method of salting,

GIVES SPLENDID DETAILS,
WORKS SMOOTHLY,
KEEPS FRESH AND CLEAR,
GOOD TO THE LAST DROP.

Sells wonderfully, continually.
$1.75 per pound. 90 cents per half pound.

PAPYROXYLINE.

BETTER THAN GUN-COTTON,
MORE ECONOMICAL,
WORKS QUICKER,
WITHOUT RETICULATION.

Only 3 or 4 grains to the ounce needed.
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Manufactured by Trapp & Munch.

This Paper is unequaled for its
BRILLIANCY,
UNIFORMITY, AND
EASY WORKING.
IT SECURES CHARMING EFFECTS.

See illustrations in Philadelphia Photographer.
$2.50 per quire, postpaid.

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An admirable Polish for Albumen or Plain Prints.

MAKES THE DEEP SHADOWS TRANSPARENT. RENDERS THE WHITES BRILLIANT. PROTECTS THE PRINT FROM DAMPNESS.

$1.00 per Bottle.

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We are the only ones in the trade who manufacture

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CHAIRS, TABLES, VASES,
LOUNGES, ETC., ETC.

AGENTS FOR KNELL'S CHAIRS, ETC.

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STRONG IN ALL ITS PARTS,
SUBSTANTIAL, HEAVY,
GREAT HELP IN POSING.

THE BEST REST IN THE WORLD!

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We have just received a large lot of new and beautiful styles.

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ROSEWOOD,
ZEBRA, ETC. ETC.

All French polished, with convex glasses. They are splendid for Porcelains, Cabinets, Vignettes, etc. Send for samples.

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HOLYOAKE CARD MOUNTS,
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BEAUTIFUL DESIGNS.

Sample books and samples sent to those wishing to order.

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FENNEMORE'S COLLODION,
PAPYROXYLINE, GERMAN PAPER,
NOTMAN'S ENAMEL,
PHOTO ACCESSORIES,
WILSON'S IMP'D REST,
FRENCH FRAMES,
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WILSON, HOOD & CO.,
Manufacturers of and Dealers in Photographic Novelties,
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TRY IT AND BE CONVINCED.

THE BEST COLLODION IN USE IS

LEWIS & HOLT'S POSITIVE AND NEGATIVE,

WITH A PRINTED FORMULA ACCOMPANYING
EACH BOTTLE.

Being the first in this country to make Collodion Pictures, they can warrant their Collodion to be one of the best in use.

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Cards enameled, Pictures copied, Solar Prints made and retouched, or painted in oil or water colors, in the best manner and at the lowest prices.

My long experience in the stock business in this city has given me a knowledge of the wants of this coast, and I am confident all who favor me with their patronage will be fully satisfied both in regard to quality and prices.

All orders will receive prompt attention, and be carefully packed for shipment. California chemicals will be sent when ordered, and at *no other time.* A share of your trade is respectfully solicited. ***Terms Cash.***

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1869.

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Land's Semi-fused Nitrate of Silver,
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Land's Collodion Paper,
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Land's Porcelain Collodion (Lithium),
Land's Negative Varnish ("German Crystal"),
Land's Caoutchouc Varnish,
Land's Fused Acet. of Soda,
Land's C. P. Iodides,
Land's C. P. Bromides,
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WITH A FULL LINE OF EVERYTHING PERTAINING TO PHOTOGRAPHY.

Reduction of Photographic Waste on same terms as in Berlin; *i. e.*, an allowance of seven-eighths the pure Nitrate of Silver for the *chloride* in waste. The *entire quantity of silver is estimated as chloride*, and paid with seven ounces of Nitrate for eight ounces of chloride found. *All* for whom we have reduced continue to send their Silver residues to us.

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We ask the attention of the Trade to our variety of Photographs of celebrities of Carte, Stereoscopic, and Carte Imperial or Cabinet Size, embracing the following: The Episcopal Bishops of the United States, the Clergy, the Catholic Clergy, the Army and Navy, Artists, Statesmen, Lawyers, Actors, Actresses, Editors, Black-Crook and Devil's Auction Ballet, Foreign Celebrities, &c., &c.

Dealers desiring stock will find our work of very first quality. Photographers cannot do better than to make selections of our pictures for study, for specimens, and for ready sales. Catalogues furnished on application, to which we call particular attention, from the fact that it embodies one feature not to be found (and we speak from experience) in any of the catalogues issued by the various publishers of photographs. It has long been the practice, in getting up catalogues, to make a general rehash from all the issues extant, which course necessitates the publisher to rely on exchanges and purchases to supply his customers. This is an injustice not to be tolerated by the buyer, who seeking to supply himself from such issues, is only able to secure 30 per cent. of the pictures therein catalogued. The feature to which we allude is the entire correctness of our list, since, for every name contained therein we possess a corresponding negative. Any of our Cartes-de-Visite will be sent by mail on receipt of price, 25 cents each, or $1.80 per dozen; colored in the finest manner, 50 cents each. Cartes Imperiale, 50 cents each; colored, $1.50 each. We are making daily additions to this list, and new catalogues will be issued monthly. We are also prepared to furnish our customers with any of the publications of other houses in our line of trade.

The Trade supplied at a Liberal Discount.

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Are now issuing in rapid succession, new subjects monthly, in addition to their already popular Chromos, entitled

	Retail Price.
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DAVIE'S GUN COTTON,

MANUFACTURED EXCLUSIVELY BY

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The following three Qualities are now made:

STANDARD	price per ounce,	$0.60
EXTRA NEGATIVE,	" "	75
INSTANTANEOUS,	" "	90

USUAL DISCOUNT TO THE TRADE.

Davie's Instantaneous Cotton contains unequalled sensitiveness, perfect gradation, absolute uniformity, and freedom from pinholes and clouds. Try it!

DAVIE'S GUN COTTON

is made entirely from the best Sea Island Staple, by a process unknown to all other chemists in the world, and is adapted to every structure of light and condition of circumstances, and is exclusively used by all first class photographers in America and has not been condemned by a living soul since the discovery of the present mode of making it.

Read the following Recommendations.

From Moses Sutton, *Detroit, Mich.*—"Your COTTON is No. 1 in every respect. Send us a few more pounds at your earliest convenience."

From J. Gurney & Son, *New York.*—"Something more than one year ago we commenced using your COTTON, and have used it ever since with the most gratifying results. We have no hesitation in recommending it to all as the most reliable photographic cotton in the market."

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From A. Bogardus, *New York.*—"Your STANDARD GUN COTTON is most admirably adapted to our structure of light. It gives sufficient strength to our negatives without redeveloping, and is in all respects the most uniform and the best we have ever used."

From R. A. Lewis, Manufacturer of the celebrated Lewis & Holt's Collodion.—"Your Cotton is universally good; it never fails to produce a fine and very sensitive film; we believe it to be the best in market."

TRY IT.—FOR SALE BY ALL STOCKDEALERS.

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Manufacturer and Wholesale Dealer in

PASSEPARTOUTS,

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MATTS.

This manufactory being the most extensive in the United States, the attention of the Trade is particularly called to our facilities for supplying dealers with goods in our line.

We have constantly on hand a large assortment of VELVET, PLAIN, and FANCY PASSEPARTOUTS of all sizes and styles.

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FANCY FRAMES

OF EVERY DESCRIPTION.

☞ All orders executed with the greatest care and promptness.

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OFFER TO WHOLESALE

DRUGGISTS AND DEALERS,

NITRATE OF SILVER,

ETHER, BROMIDES, IODIDES,

CHLORIDE OF GOLD,

AND ALL OTHER

PHOTOGRAPHIC CHEMICALS.

MATS,

PLAIN, BEVELED, and FANCY,

FOR

PICTURES, PHOTOGRAPHS, ANYTHING
THAT IS FRAMED.

Regular Sizes of Various Styles
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ODD SIZES,

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EXECUTED IN THE BEST STYLE.

Passepartouts,

REGULAR SIZES IN VARIETY.

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Photographic Chemicals,

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STOCKDEALERS ONLY SUPPLIED.

ESTABLISHED IN 1862.

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12x15	13.50	14.00	15.00		18.00	21.00	18.50	
13x16	15.00	16.00	17.00		20.00	23.00	21.00	
14x17	18.00	18.00	20.00		23.50	25.00	23.50	
15x18	20.00	21.00	22.00		24.50	26.00	25.00	
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Width of visual angle, ranging from 80° to 90°; depth of focus; extreme sharpness over the whole field; true perspective; freedom from all distortion in copying; portability and cheapness.

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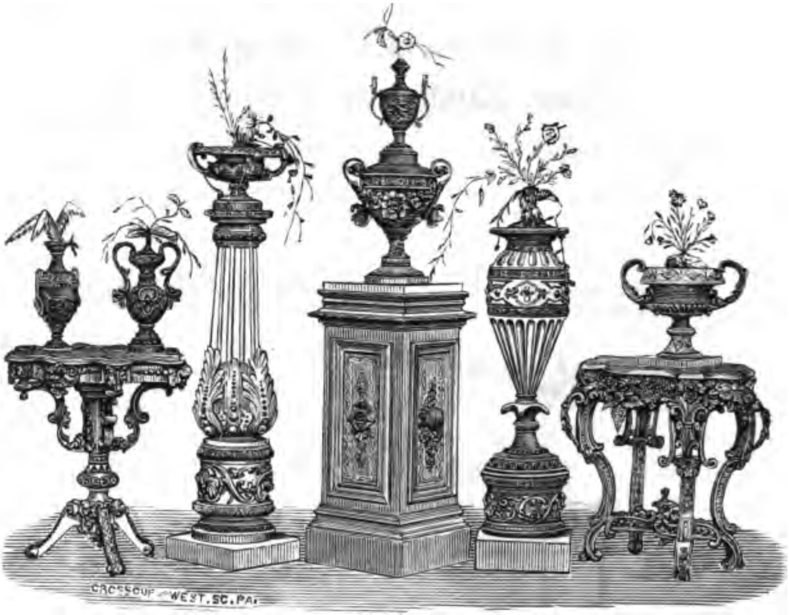
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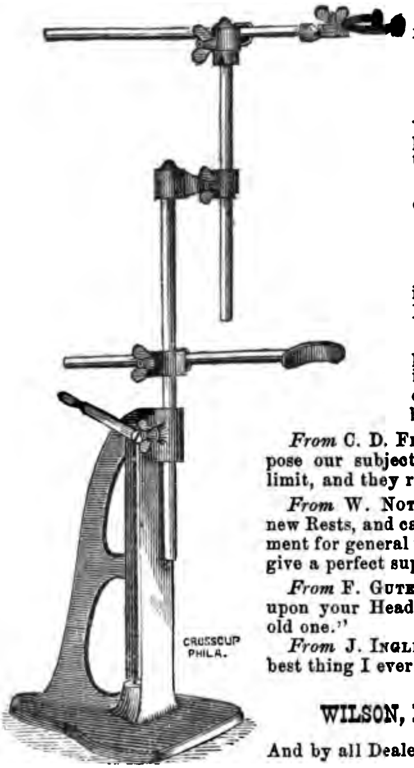

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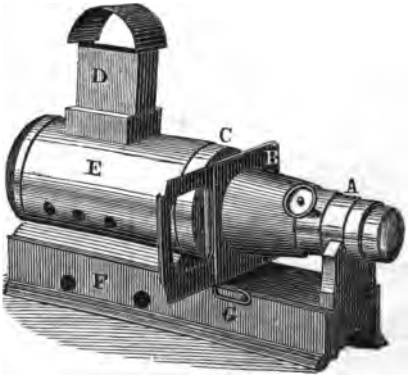

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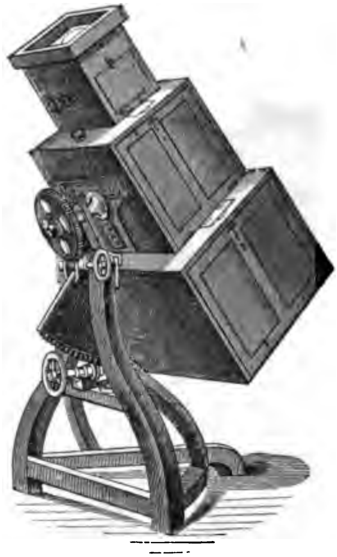

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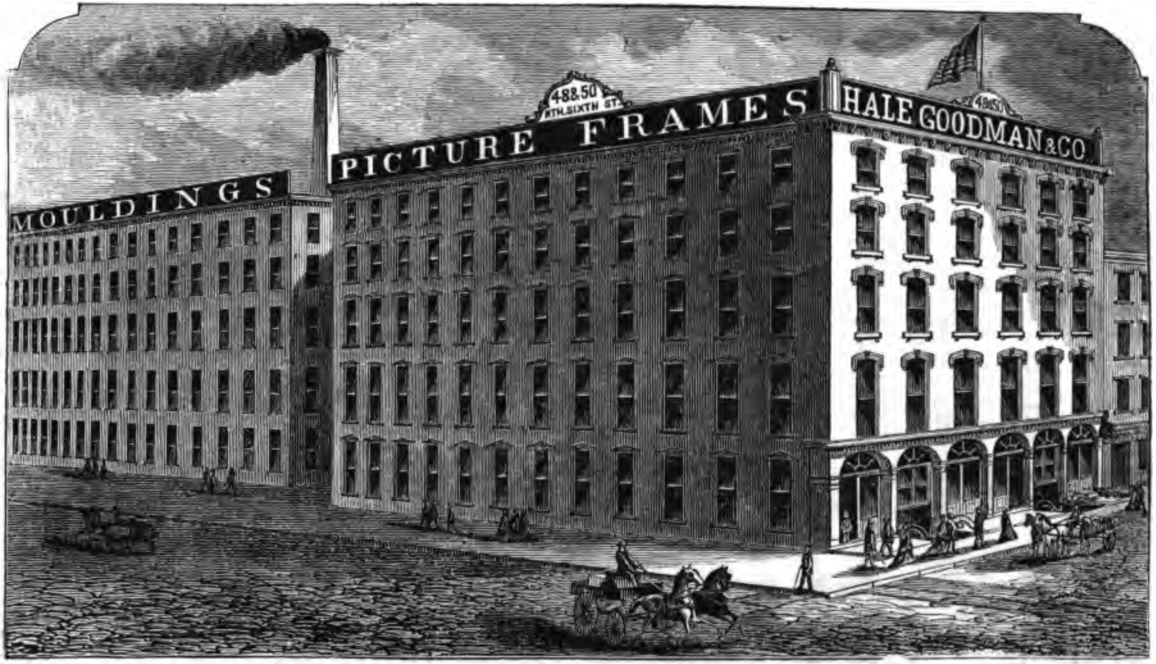

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